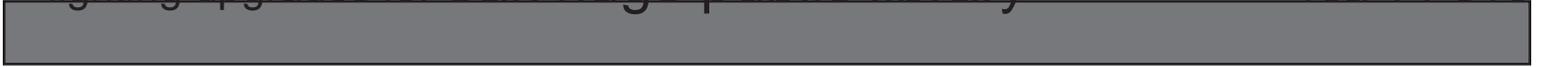


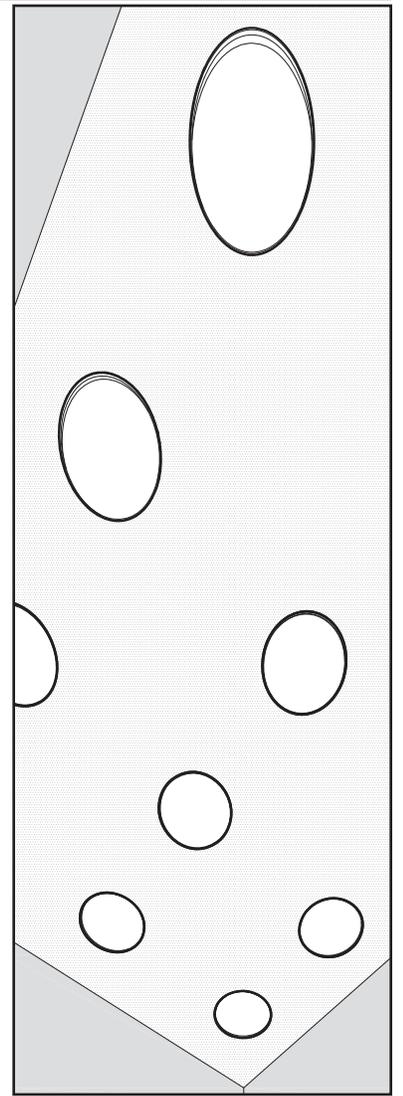
# project manual

lighting upgrades for oak ridge public library

rca 14-010



contract # FY2015-177



construction documents | 2014 october 21

oak ridge, tn

**redChair:**architects

220 w. jackson ave. knoxville, tn v | 865.633.8058 f | 865.633.9059 w | redchairarchitects.com

SECTION 00 00 02 – PROJECT DIRECTORY

**Owner:**

City Of Oak Ridge  
Municipal Building  
200 South Tulane Avenue  
Oak Ridge, TN 37830  
Contact : Pat Fallon - V | 865.425.1847

**Architectural:**

Red Chair Architects  
220 W. Jackson Avenue  
Knoxville, TN 37902  
V | 865.633.9058 F | 865.633.9058

**Electrical:**

I.C. Thomasson Associates  
1114 Clinch Ave.  
Knoxville, TN 37916  
V | 865.525.3488.

END OF SECTION 00 00 02



**SECTION 00 01 10 – TABLE OF CONTENTS**

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**SECTION 00 01 15 – LIST OF DRAWINGS**

**GENERAL**

G0.01 INDEX OF DRAWINGS, INFORMATION, SYMBOLS, LOCATION MAP, ABBREVIATIONS & KEY PLAN

**ARCHITECTURAL DRAWINGS**

AD1.10 MAIN AND UPPER LEVEL REFLECTED CEILING DEMOLITION PLANS, LEGEND AND NOTES

A1.10 MAIN AND UPPER LEVEL REFLECTED CEILING PLANS, LEGEND AND NOTES

A1.11 ENLARGED MAIN LEVEL REFLECTED CEILING PLAN, LEGEND AND DETAILS

**ELECTRICAL DRAWINGS**

E0.01 LEGEND, NOTES, DETAILS, AND SCHEDULES

E1.10 MAIN AND UPPER LEVELS LIGHTING PLAN

**END OF SECTION 00 01 15**

**SECTION 00 30 00 – AVAILABLE INFORMATION****PART 1 - GENERAL****1.1 INFORMATION AVAILABLE TO BIDDERS**

- A. The following submittals pertaining to this Project follow Specification Section 00 30 00.
  - 1. Section 00 30 00.1 – SESCO Lighting's Oak Ridge Library Lighting Submittal (57 pages) dated October 16, 2014.
  - 2. Section 00 30 00.2 – Prudential Lighting's Fixture D4, D6, SS and F Installation Instructions received from SESCO Lighting (5 pages), no date.
- B. Cutsheets and selected manufacturer's installation instructions listed above are available to bidders. This information was compiled for design purposes and is not part of the Contract Documents.
- C. The use and interpretation of the information listed above is entirely the responsibility of the using party.

**PART 2 - PRODUCTS (Not Used)****PART 3 - EXECUTION (Not Used)****END OF SECTION 00 30 00**

**SESCO Lighting** ▪ We take the *///* out of *///*umination.™

702 Lindsay Pl.  
Knoxville, TN 37919

865-633-9288 (Ph)  
865-633-9278 (FX)

www.sescolighting.com  
John Palk, General Manager

**Knoxville**



**DATE:** 10/16/14

**Prepared for:** CITY OF OAK RIDGE

**Contractor:**

**Architect:** RED CHAIR ARCHITECTS

**Engineer:** IC THOMASSON

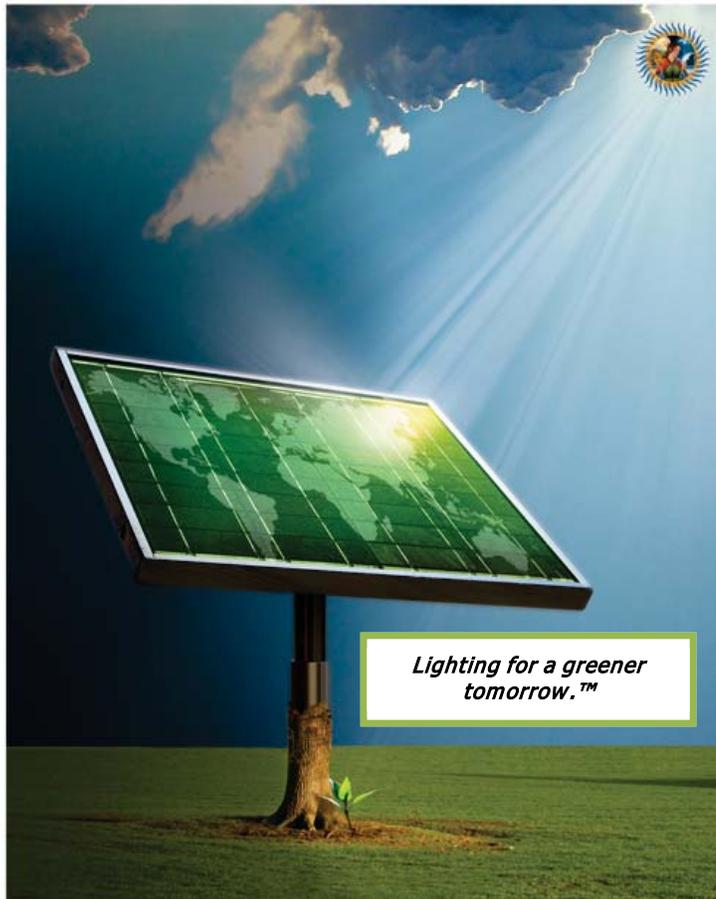
**Prepared by:** SANDY BOBST

**Contact Name:** DIANNA OSICKEY

**Phone Number:**

**Number of Pages:** 57

**Project Name/Number:** OAK RIDGE LIBRARY



# LIGHTING SUBMITTAL



# SESCO Lighting

WE TAKE THE *///* OUT OF *///*UMINATION

## Project: OAK RIDGE LIBRARY

Contents - October 15, 2014

Type	Factory	Description
A	LDLT	4124 D1 ST L 9B A S 1 ??? E
CN	INTN	SS6G2-3000-358-??? IC630-HZ-SF
CNWW	INTN	SS6G2-3000-358-??? IC635-HZ-SF
CR	INTN	SS8RG2-3000-358-???V IC830 HZ-SF
CS	PBH	STONE LIGHTING CL530 FR PC DOB10
D4	PRUD	P-8940-LED35LO-FWA-TMW-SC-UNV-X1-ND-MO D
D6	PRUD	P-8960-LED35SO-CWA-TMW-SC-UNV-X1-DM10
E	WILL	75L 4 PH50 WG-7511-LED UNV
G	INST	PL 3.5 35K 15 HM 36 REM MW WL
W4	FINE	S17-LED-VCF-PF-4-HO-3500k-???
SS	PRUD	R1-LED35 HO-20'-SAL-YGW-UNV-SUR-X3-ND
TR	SIST	1690-835-20-45-???V-01
X	BEGH	OL2 LG ? C CR
X2	BEGH	PCH G SA
	WATT	LMRC-213
	WATT	LMSW-105-W
	WATT	LMCT-100
F	PRUD	STR-LED35-SO-20'-TMW-D1-SC-UNV-ND



# Unlock your vision

## VERSAFORM 2'X4' LED



DIRECT, BEAM SHAPING LIGHT GUIDE WITH STEPPED CENTER DIFFUSER  
CRI >90 3500K, 6800 lm

Project:

Spec Type:

Catalog No: 4124DxxxL9BA

Qty

Line Notes:



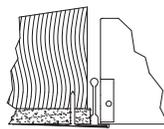
### Ordering guide

Product Type	Version	Configuration	Light Source*	CRI/CCT	Lumens *	Housing	Wiring †	Voltage ‡	Driver ‡
<b>4124</b>		<b>ST</b>	<b>L</b>	<b>9B</b>	<b>A</b>				
VersaForm 2'x4' LED	<b>D1</b> Standard T Grid <b>D2</b> Slot T Grid <b>A1</b> Air Return on Standard T Grid <b>A2</b> Air Return on Slot T Grid	<b>ST</b> Standalone	<b>L</b> LED	<b>8C</b> CRI 80 3000K <b>8B</b> CRI 80 3500K <b>8A</b> CRI 80 4000K <b>9B</b> CRI 90 3500K	<b>D</b> 4000 lm <b>C</b> 5200 lm <b>A</b> 6800 lm	<b>S</b> Standard (22ga.) <b>C</b> Chicago Plenum	<b>1</b> 1 cct <b>5</b> 1 cct w/ BP <b>7</b> 1 cct w/ Dimming	<b>1</b> 120V <b>2</b> 277V <b>3</b> 347V	<b>E</b> Standard Dimming

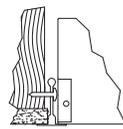
\* Nominal values within a range. Consult ies file for exact color temp and lumens † Consult website for complete list of standard wiring options

### Upgrades & Accessories Please indicate with check mark.

- Drywall Kit Trim Mount
- Drywall Kit Trimless Mount
- Flex Whip



**Drywall Kit**  
Trimless mount detail



**Drywall Kit**  
Trim mount detail



**Wood Frame**  
Can be mounted to wood frame or with hanger wire.



**Hanger Wire**

### Integrated Controls Please indicate with check mark.

- Response Daylight Sensor Single Zone (DS)
- Philips Actilume Occupancy Sensor (DO) (includes field commissionable daylight sensor)



Submitting Agency:



**SESCO Lighting**

702 Lindsay Place, Knoxville, TN 37919  
Tel: (865) 633-9288 Fax: (865) 633-9278

Description: **4124 D1 ST L 9B A S 1 ??? E**

Project: **OAK RIDGE LIBRARY**

Notes:

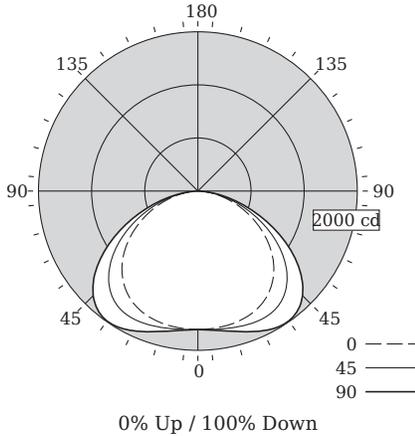
Type:

**A**

## VERSAFORM 2'X4' LED

DIRECT, BEAM SHAPING LIGHT GUIDE WITH STEPPED CENTER  
DIFFUSER

### Photometry



Total Output	6387 lm
Efficacy	86.9 lm/W
CCT	3340K
CRI	92
R9	77
Distribution	0% Up / 100% Down
Spacing Criteria (0/90°)	1.38/1.69

Fixture photometry has been conducted by an NVLAP accredited testing laboratory in accordance with IESNA LM-79:2008

Lumen maintenance of the LEDs has been tested by the manufacturer in accordance with IESNA LM-80:2008

IES files for this and other photometric options can be downloaded online at [www.lightingproducts.philips.com](http://www.lightingproducts.philips.com)

### Candela Distribution

Vertical Angle	Horizontal Angle				Zonal Lumens
	0	22.5	45	67.5	
0	1739	1739	1739	1739	0
5	1736	1743	1746	1749	167
15	1721	1739	1773	1807	503
25	1670	1709	1798	1892	832
35	1553	1615	1758	1918	1104
45	1348	1415	1583	1771	1225
55	1053	1112	1258	1422	1129
65	713	747	842	949	841
75	375	388	432	484	464
85	95	96	101	110	121
90	0	0	0	0	0
95	0	0	0	0	0
105	0	0	0	0	0
115	0	0	0	0	0
125	0	0	0	0	0
135	0	0	0	0	0
145	0	0	0	0	0
155	0	0	0	0	0
165	0	0	0	0	0
175	0	0	0	0	0
180	0	0	0	0	0

### Coefficients of Utilization (%)

RCR	Ceiling				Wall					
	70	50	30	10	70	50	30	10		
0	119	119	119	119	116	116	116	111	111	111
1	108	103	99	95	106	101	97	97	94	91
2	98	90	83	77	95	88	81	84	79	74
3	89	78	70	63	87	77	69	74	67	61
4	81	69	60	53	79	67	59	65	57	52
5	74	61	52	45	72	60	51	58	50	44
6	68	55	45	39	66	54	45	52	44	38
7	63	49	40	34	61	48	40	47	39	34
8	59	45	36	30	57	44	36	43	35	30
9	55	41	32	27	53	40	32	39	32	27
10	51	38	29	24	50	37	29	36	29	24

### Avg. Luminance (cd/m2)

Vertical Angle	Horizontal Angle		
	0	90	
55	2840	3392	4034
65	2608	3081	3658
75	2242	2581	3005
85	1679	1790	1986

**LED lighting facts**  
A Program of the U.S. DOE

---

**Light Output (Lumens)** 6387  
**Watts** 73.5  
**Lumens per Watt (Efficacy)** 86

---

**Color Accuracy** 92  
Color Rendering Index (CRI)

---

**Light Color** 3340 (Bright White)  
Correlated Color Temperature (CCT)

2700K 3000K 4500K 6500K

---

**Warranty\*\*** Yes

All results, except LED Lumen Maintenance, are according to IESNA LM-79:2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting. The U.S. Department of Energy (DOE) verifies product test data and results.

**\*\* See [www.lightingfacts.com/products](http://www.lightingfacts.com/products) for details.**

Registration Number: F46Z-7KUZ45 (7/11/2014)  
Model Number: 4x24xxxL9BA  
Type: Luminaire - Troffer/Grid Ceiling

### Electrical Specifications

Input Voltage	120V	277V
Input Power	73.5W	71.3W
Input Current	0.615A	0.264A
Power Factor	0.996	0.976
Total Harm. Distortion	9.6%	14.3%

Tested values – contact technical support for rated values.  
Off-state power zero unless certain controls are specified.

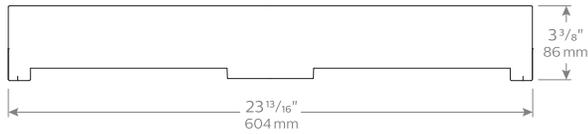


## VERSAFORM 2'X4' LED

DIRECT, BEAM SHAPING LIGHT GUIDE WITH STEPPED CENTER DIFFUSER

### Options and Details

Cross Section



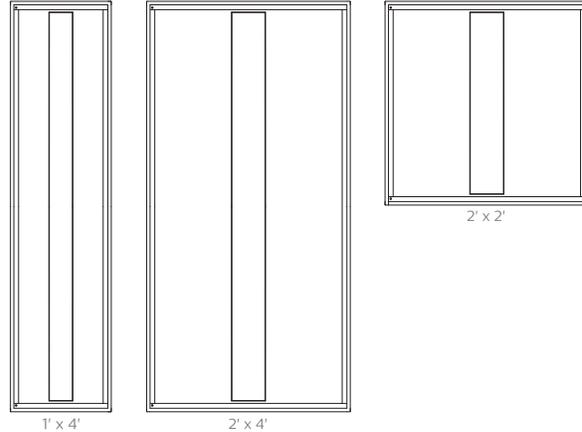
Housing



Light Engine



Lens View



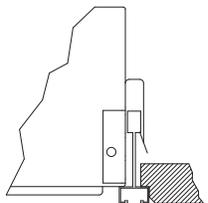
### Mounting



<sup>15/16"</sup>  
24 mm Tee D1 option

#### D1 Standard T-Grid

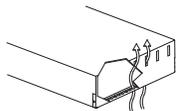
Option D1 works with 9/16" and 15/16" flat T-grid ceilings. It can also be used with slot T-grid ceilings, but it will not sit flush with the bottom of the T-bar.



<sup>9/16"</sup>  
14 mm Bolt Slot Tee D2 option

#### D2 Slot T-Grid

Option D2 is designed to sit close to flush with slot T-grid ceilings and some tegular tile ceiling types.



#### Air Return

Air return is available with the VersaForm 2'x2' & 2'x4' options. Vent area is finished in black.

### Housing

Die-formed, post painted, 22 gauge cold-rolled steel. Wire entrance with additional knock-out available on top side for electrical connections.

### Weight

Maximum: 2x2 = 24lb, 1x4 = 28lb, 2x4 = 38lb

### Optical System

The optical frame assembly consists of integrated LED arrays edgelighting a light guide panel in order to deliver uniform controlled light through a lower lens. The optical frame ends are constructed from die-formed cold-rolled steel, assembled together with extruded aluminum profiles in a sturdy frame. The frame is hinged (side marked) to allow easy access to the inside of the fixture. Maintenance can be performed from below the ceiling.

### Standard Driver

0-10V Dimming – 5-100%. Output is class 2 rated, contact factory for other options.

### Lumen Maintenance

At an ambient temperature of 25°C, the LED lumen maintenance expectation is L<sub>70</sub> (9k) > 54 kh. Reported according to IES TM-21 Addendum A methodology (9k LM-80 test duration)

### Mounting

**Recessed:** Fixtures can be fastened directly to the T-bar grid and/or tied-off to the building structure.  
**Surface:** Fixtures can be mounted over recessed junction box and side entry also available.

### Electrical

Factory pre-wired with driver safety disconnect.

### Wiring

**Recessed:** Optional flex whips are supplied in 6' lengths.  
**Surface:** Standard wiring configurations available.

### Approvals

Certified to UL, CSA, DLC & IES Standards. City of Chicago Approved CCEA (housing option C).

### Finish

Housing and Frame painted, high quality, powder coated matte white only.

### Environment

Rated for dry & damp locations in operating in ambient temperatures of 25°C.

Due to continuing product improvements, Philips Ledalite reserves the right to change the specifications without notice.



Submitting Agency:



**SESCO Lighting**

702 Lindsay Place, Knoxville, TN 37919  
Tel: (865) 633-9288 Fax: (865) 633-9278

Description: **SS6G2-3000-358-??? IC630-HZ-SF**

Project: **OAK RIDGE LIBRARY**

Notes:

Type:

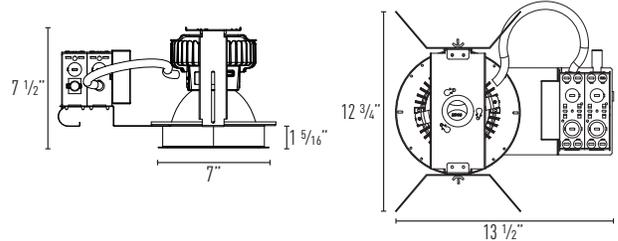
**CN**

# SS6G2 / IC630

6" Architectural LED Round Generation 2 / Open Reflector



JOB NAME		CATALOG NUMBER	
NOTES		TYPE	



Cut-out: 6 1/2"

Order Matrix | Example: SS6G22000308-27-EM

A	B	C	D	E
<b>A</b> Series			<b>D</b> Dimming	
<b>SS6G2</b> 6" LED Recessed Round			blank Non-Dimming -D10V1 0-10V Dimming 1% -D10V 0-10V Dimming 10% -ED10V1 eldoLED 0-10V 1% <sup>1</sup> -ED10V01 eldoLED 0-10V 0.1% <sup>1</sup> -LUT1 Lutron Hi-Lume 1% -LUT Lutron EcoSystem 1% -LUT5 Lutron EcoSystem 5% -EDALI1 eldoLED DALI 1% <sup>1</sup> -EDALI01 eldoLED DALI 0.1% <sup>1</sup>	
<b>B</b> Module Lumen Output			<b>E</b> Voltage	
1100 1100 Lumen 1500 1500 Lumen 2000 2000 Lumen <b>3000</b> 3000 Lumen			blank 120V 27 277V	
<b>C</b> Color Temperature / CRI			<b>E</b> Options	
278 2700K / 80 CRI 308 3000K / 80 CRI <b>358</b> 3500K / 80 CRI 408 4000K / 80 CRI			-EM Emergency Backup -I100 C-Channel Bar Hanger -I200 Flat Bar Hanger -I400 Wood Joist Bar Hanger	

Notes:

1. eldoLED dimming not available for 3000lm module

Reflector Matrix | Example: IC630HZ-SF

A	B	C
<b>A</b> Series		<b>C</b> Trim
<b>IC630</b> 6" Open Reflector		-SF Self Flanged -SFW Self Flanged White
<b>B</b> Reflector Finish		
C Clear <b>HZ</b> Haze W White		

Catalog Number	System Wattage *	Delivered Lumens **
SS6G21100358 / IC630C	15.89W	1085lm @ 3500K
SS6G21500358 / IC630C	18.75W	1462lm @ 3500K
SS6G22000358 / IC630C	24.58W	1770lm @ 3500K
SS6G23000358 / IC630C	37.25W	2618lm @ 3500K

\* System wattage include driver and LED module consumption.

\*\* Delivered lumen output will vary depending on CCT.

### LED MODULE

- Powered by OSRAM PrevaLED<sup>®</sup> Cube LED Module
- 50,000 hours at 70% lumen maintenance
- No heat, mercury or UV
- Available in 1100, 1500, 2000 and 3000 lm
- CRI = 80 & CCT 2700K, 3000K, 3500K, 4000K

### ELECTRICAL SYSTEM

- Thermal protection guard protects the LED module from overheating and will dim LED module if necessary
- Power factor >.9, 50/60Hz
- Multiple dimming options available

### OPTICAL SYSTEM

Specification grade reflector with 1.2mm thickness. Reflector available in clear specular, haze or white. Architectural, discrete polished self flange standard. Optional painted white flange is available. Meets RP-1 requirements with controlled light distribution at a 55° cut off.

### FRAME CONSTRUCTION

Heavy duty galvanized steel frame with a large access junction box. ETL listed for through wiring. LED light engine and driver are accessible from above or below ceiling.

### INSTALLATION

The luminaire is type Non-IC. Insulation must be kept at a minimum of 3" away from fixture. Universal mounting brackets included. Compatible with C-channel, flat bar, wood joist bar hanger and EMT. Bar hangers must be ordered separately. C-channel are recommended for T-bar ceilings. Maximum ceiling thickness is 1 1/4".

### ACCESSORIES

Compatible with decorative drop and Infuz<sup>™</sup> accessories. See page 2 for options.

### EMERGENCY BACKUP

Remote test switch included. Emergency driver operates LED load of up to 7.0 Watts at a nominal 450 lumens for a minimum of 90 minutes.

### LISTING/WARRANTY

- ETL listed to US and Canadian standards for damp locations.
- 10-Year Intense LED Limited Warranty

ARCHITECTURAL LUM-0911-14-P-16

Intense Lighting, LLC | 3340. E La Palma Ave. | Anaheim, CA 92806 | Phone: 1.800.961.5321 | Fax: 1.800.961.5322 | www.intenselightning.com

Note: Specifications and dimensions subject to change without notice.



Submitting Agency:



**SESCO Lighting**

702 Lindsay Place, Knoxville, TN 37919  
Tel: (865) 633-9288 Fax: (865) 633-9278

Description: **SS6G2-3000-358-??? IC630-HZ-SF**

Project: **OAK RIDGE LIBRARY**

Notes:

Type:

**CN**

JOB NAME		CATALOG NUMBER	
NOTES		TYPE	

## 6" Decorative Recessed Accessories



DECORATIVE

Decorative glass and acrylic accessories are compatible with select reflectors. Customize and create your environment with the options below.

**ORDERING INFORMATION:**

Add accessory part number to the end of the reflector part number. (Example: IC630C-SF-D1R)

ORDERING INFO	DESCRIPTION	OD	ID	THICKNESS
-D1R	6" Red Acrylic Ring 1 3/8"	7 3/4"	5 1/2"	1/8"
-D2R	6" Red Acrylic Ring 2 3/8"	7 3/4"	3 1/2"	1/8"
-D1B	6" Blue Acrylic Ring 1 3/8"	7 3/4"	5 1/2"	1/8"
-D2B	6" Blue Acrylic Ring 2 3/8"	7 3/4"	3 1/2"	1/8"
-D1G	6" Green Acrylic Ring 1 3/8"	7 3/4"	5 1/2"	1/8"
-D2G	6" Green Acrylic Ring 2 3/8"	7 3/4"	3 1/2"	1/8"
-D5	6" Tempered Glass Decorative Drop	7 3/4"	NA	5/32"
-D6	6" Tempered Glass Decorative Drop	7 3/4"	NA	5/32"
-D7	6" Tempered Glass Decorative Drop	7 3/4"	NA	5/32"
-D8	6" Tempered Glass Ring 1 3/8"	7 3/4"	5 1/2"	5/32"
-D9	6" Sandblasted Tempered Glass Ring 2 3/8"	7 3/4"	3 1/2"	5/32"



INFUZ

Infuz decorative accessories may be used with select reflectors. Accessory kits are factory installed. Custom material available by special order. Minimum order and lead times may apply. Consult factory.

**How to Order:**

1. Enter your specified reflector under section "A".
2. Specify the Infuz adder on the reflector part number. (Example: IC630C-SF-IZDM-5-MO)



**Flush Mount Recessed**

Order Matrix | Example: IC630C-SF-IFZFM-W-1

A	B	C	D
<b>A</b>	Reflector	<b>D</b>	Material
	Specify Compatible Reflector	-1	Red Crush
		-2	Blue Crush
		-3	Tiger Thatch
<b>B</b>	Series	-4	Linea Vert
		-5	Bronze Weave
<b>-IFZFM</b>	Infuz Flush Mount	-6	Fossil Leaf
<b>C</b>	Inner Reflector		
<b>-W</b>	White		
<b>-HZ</b>	Haze		



**Drop Mount Recessed**

Order Matrix | Example: IC630C-SF-IFZDM-1

A	B	C	
<b>A</b>	Reflector	<b>C</b>	Material
	Specify Compatible Reflector	-1	Red Crush
		-2	Blue Crush
		-3	Tiger Thatch
<b>B</b>	Series	-4	Linea Vert
		-5	Bronze Weave
<b>-IFZDM</b>	Drop Mount	-6	Fossil Leaf



Type: Red Crush  
Item Code: 1



Type: Blue Crush  
Item Code: 2



Type: Tiger Thatch  
Item Code: 3



Type: Linea Vert  
Item Code: 4



Type: Bronze Weave  
Item Code: 5



Type: Fossil Leaf  
Item Code: 6

ARCHITECTURAL LUM-0911-14 P-17



Intense Lighting, LLC | 3340, E La Palma Ave. | Anaheim, CA 92806 | Phone: 1.800.961.5321 | Fax: 1.800.961.5322 | www.intenselighting.com

Note: Specifications and dimensions subject to change without notice.





JOB NAME		CATALOG NUMBER	
NOTES		TYPE	

**SS6G21100358 / IC630C**

6" Architectural LED Round / Open Reflector

Report #: L10135501

Reflector Finish: Specular Clear

Luminaire Watts: 16.06W

Luminaire Lumens: 1084.91 lm

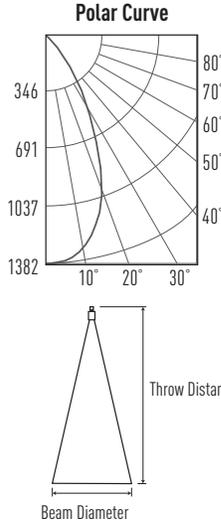
Lumens Per Watt: 67.55

Color Temperature: 3300K

Color Rendering Index: 84.6

Spacing Criteria: 0.84

Lighting Facts  
Reg. #: L5DN-433BVD



Throw Distance (d)	8' (2.4m)	10' (3m)	12' (3.7m)
Beam Diameter	6.6' (2m)	8.3' (2.5m)	9.9' (3m)
Illuminance (fc)	21.6	13.8	9.6
Illuminance (lux)	232	149	103

**Coefficients of Utilization**

Effective Floor Cavity Reflectance = .20

RC	Wall Reflectance														
	80		70		50		30		0						
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	0
1	113	110	108	106	111	108	106	104	104	102	101	100	99	98	93
2	108	103	98	95	105	101	97	94	98	95	92	95	92	90	86
3	102	96	91	86	100	94	90	86	92	88	84	89	86	83	80
4	97	89	84	79	95	88	83	79	86	81	78	84	80	77	75
5	92	84	78	73	90	83	77	73	81	76	72	79	75	72	70
6	87	78	72	68	86	78	72	68	76	71	67	75	70	67	65
7	83	74	68	63	82	73	67	63	72	67	63	71	66	63	61
8	79	69	63	59	78	69	63	59	68	63	59	67	62	59	57
9	75	66	60	56	74	65	59	56	64	59	55	63	59	55	54
10	72	62	56	52	71	62	56	52	61	56	52	60	55	52	51

**Zonal Lumens and Percentages**

Zone	Lumens	%Fixture
0-30	769.83	71
0-40	970.39	89.4
0-60	1069.99	98.6
0-90	1084.91	100
40-70	105.29	9.7
60-80	10.32	1
90-180	0	0
0-180	1084.91	100

**Zonal Lumen Summary**

Zone	CP	Lumens
0	1382	105.05
10	1310	334.24
20	1000	330.54
30	519	200.56
40	178	88.7
50	20	10.9
60	6	5.69
70	5	4.63
80	4	4.6
90	0	0

**SS6G21500358 / IC630C**

6" Architectural LED Round / Open Reflector

Report #: L10135503

Reflector Finish: Specular Clear

Luminaire Watts: 18.75W

Luminaire Lumens: 1461.65 lm

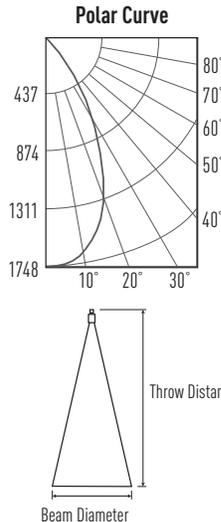
Lumens Per Watt: 77.95

Color Temperature: 3310K

Color Rendering Index: 83.4

Spacing Criteria: 0.86

Lighting Facts  
Reg. #: L5DN-N5DBMW



Throw Distance (d)	8' (2.4m)	10' (3m)	12' (3.7m)
Beam Diameter	6.9' (2.1m)	8.6' (2.6m)	10.3' (3.1m)
Illuminance (fc)	27.3	17.5	12.1
Illuminance (lux)	294	188	131

**Coefficients of Utilization**

Effective Floor Cavity Reflectance = .20

RC	Wall Reflectance														
	80		70		50		30		0						
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	0
1	113	110	108	105	111	108	106	104	104	102	100	100	99	97	93
2	107	102	98	95	105	101	97	94	97	94	91	94	92	90	86
3	102	95	90	86	100	94	89	85	91	87	84	89	85	83	80
4	96	89	83	79	95	88	82	78	85	81	77	83	80	76	74
5	91	83	77	73	90	82	76	72	80	75	72	78	74	71	69
6	87	78	72	67	85	77	71	67	75	70	66	74	69	66	64
7	82	73	67	62	81	72	66	62	71	66	62	70	65	62	60
8	78	69	62	58	77	68	62	58	67	62	58	66	61	58	56
9	74	65	59	55	73	64	58	54	63	58	54	62	57	54	53
10	71	61	55	51	70	61	55	51	60	55	51	59	54	51	49

**Zonal Lumens and Percentages**

Zone	Lumens	%Fixture
0-30	1007.77	68.9
0-40	1292.7	88.4
0-60	1441.47	98.6
0-90	1461.65	100
40-70	156.83	10.7
60-80	14.24	1
90-180	0	0
0-180	1461.65	100

**Zonal Lumen Summary**

Zone	CP	Lumens
0	1748	133.33
10	1667	429.39
20	1308	445.05
30	727	284.93
40	264	132.74
50	30	16.02
60	9	8.06
70	6	6.18
80	5	5.95
90	0	0

All testing was conducted in accordance with **LM-79-08**, Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products as published by the Illuminating Engineering Society of North America (IESNA).

ARCHITECTURAL LM-80-011-14 P-18

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Note: Specifications and dimensions subject to change without notice.





JOB NAME		CATALOG NUMBER	
NOTES		TYPE	

**SS6G22000358 / IC630C**

6" Architectural LED Round / Open Reflector

Report #: L10135505

Reflector Finish: Specular Clear

Luminaire Watts: 24.58W

Luminaire Lumens: 1770.05 lm

Lumens Per Watt: 72.01

Color Temperature: 3320K

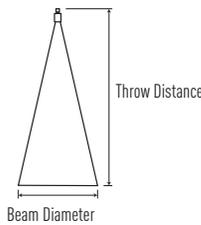
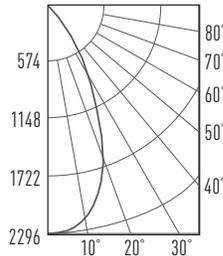
Color Rendering Index: 83.4

Spacing Criteria: 0.82

Lighting Facts  
Reg. #: L5DN-KHX3V5



Polar Curve



Throw Distance (d)	8' (2.4m)	10' (3m)	12' (3.7m)
Beam Diameter	6.5' (2m)	8.2' (2.5m)	9.8' (3m)
Illuminance (fc)	35.9	23	15.9
Illuminance (lux)	386	247	172

Coefficients of Utilization

Effective Floor Cavity Reflectance = .20

RC	80				70				50				30				0	
	Wall Reflectance																	
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
1	113	110	108	106	111	108	106	104	104	102	101	101	99	98	93	93	0	
2	108	103	99	95	105	101	97	94	98	95	92	95	92	90	86	86	0	
3	102	96	91	87	100	94	90	86	92	88	85	89	86	83	80	80	0	
4	97	89	84	80	95	88	83	79	86	82	78	84	80	77	75	75	0	
5	92	84	78	74	91	83	77	73	81	76	73	79	75	72	70	70	0	
6	88	79	73	68	86	78	72	68	76	71	68	75	71	67	65	65	0	
7	83	74	68	64	82	73	68	64	72	67	63	71	66	63	61	61	0	
8	79	70	64	60	78	69	64	60	68	63	59	67	62	59	57	57	0	
9	76	66	60	56	74	65	60	56	64	59	56	64	59	56	54	54	0	
10	72	62	57	53	71	62	56	53	61	56	53	60	56	52	51	51	0	

Zonal Lumens and Percentages

Zone	Lumens	%Fixture
0-30	1267.57	71.6
0-40	1591.31	89.9
0-60	1745.07	98.6
0-90	1770.05	100
40-70	163.72	9.2
60-80	17.68	1
90-180	0	0
0-180	1770.05	100

Zonal Lumen Summary

Zone	CP	Lumens
0	2296	174.61
10	2179	554.44
20	1646	538.51
30	842	323.74
40	282	138.7
50	27	15.06
60	11	9.96
70	8	7.72
80	6	7.3
90	0	0

**SS6G23000358 / IC630C**

6" Architectural LED Round / Open Reflector

Report #: L10135507

Reflector Finish: Specular Clear

Luminaire Watts: 37.25W

Luminaire Lumens: 2618.14 lm

Lumens Per Watt: 70.29

Color Temperature: 3250K

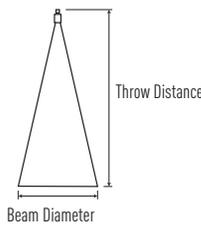
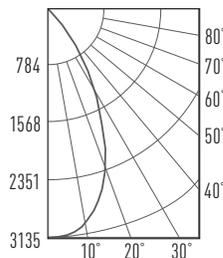
Color Rendering Index: 83.9

Spacing Criteria: 0.86

Lighting Facts  
Reg. #: L5DN-OFR2VT



Polar Curve



Throw Distance (d)	8' (2.4m)	10' (3m)	12' (3.7m)
Beam Diameter	6.8' (2.1m)	8.5' (2.6m)	10.2' (3.1m)
Illuminance (fc)	49	17.5	21.8
Illuminance (lux)	527	337	234

Coefficients of Utilization

Effective Floor Cavity Reflectance = .20

RC	80				70				50				30				0	
	Wall Reflectance																	
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
1	113	110	108	105	111	108	106	104	104	102	100	100	99	97	93	93	0	
2	107	102	98	95	105	101	97	93	97	94	91	94	92	89	86	86	0	
3	102	95	90	86	100	94	89	85	91	87	84	89	85	82	80	80	0	
4	96	89	83	79	95	88	82	78	85	81	77	83	79	76	74	74	0	
5	91	83	77	72	90	82	76	72	80	75	71	78	74	71	69	69	0	
6	87	78	71	67	85	77	71	67	75	70	66	74	69	66	64	64	0	
7	82	73	67	62	81	72	66	62	71	66	62	70	65	61	60	60	0	
8	78	68	62	58	77	68	62	58	67	62	58	66	61	58	56	56	0	
9	74	65	59	54	73	64	58	54	63	58	54	62	57	54	52	52	0	
10	71	61	55	51	70	61	55	51	60	55	51	59	54	51	49	49	0	

Zonal Lumens and Percentages

Zone	Lumens	%Fixture
0-30	1799.99	68.8
0-40	2309.92	88.2
0-60	2578.1	98.5
0-90	2618.14	100
40-70	284.78	10.9
60-80	28.95	1.1
90-180	0	0
0-180	2618.14	100

Zonal Lumen Summary

Zone	CP	Lumens
0	3135	239.05
10	2985	766.48
20	2329	794.46
30	1301	509.93
40	473	238.38
50	55	29.81
60	18	16.6
70	12	12.35
80	9	11.08
90	0	0

All testing was conducted in accordance with **LM-79-08**, Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products as published by the Illuminating Engineering Society of North America (IESNA).

ARCHITECTURAL LM-80-011-14 P-19

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# DIMMING COMPATIBILITY

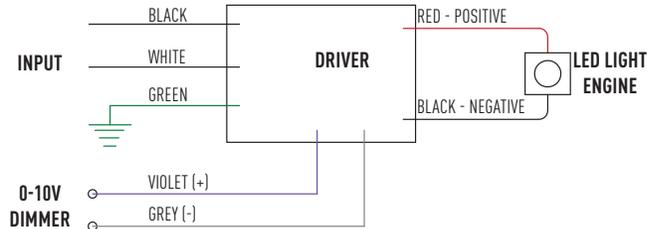
JOB NAME		CATALOG NUMBER	
NOTES		TYPE	

### 0-10V DIMMING

- 120V or 277V
- Dims down to 1% or 10% light output
- Consult dimming manufacturer for installation instructions and power packs

### COMPATIBLE DIMMERS

Manufacturer	Part Number(s)
HUNT	PS-010-IV-120V, PS-010-WH-120V, PS-010-3W-IV-120, PS-010-3W-WH-120V, PS-010-IV-277V, PS-010-WH-277V, PS-010-3W-IV-277V, PS-010-3W-WH-277V, FD-010: PS-IFC-010-IV, PS-IFC-010-WH-120/277V, FD-010: PS-IFC-010-3W-IV, PS-IFC-010-3W-WH-120/277V, FD-010-120V, FD-010-277V
Leviton	Leviton Centura Fluorescent Control System, IllumaTech™ IP7 Series, DPSPE-212
Lightolier	ZP600FAM120, MP1500FAM120, V2000FAMU
Lithonia	LEQ BC, LEQ LVBC, SLD LVBC, S01DC
Lutron	DVTV, NTFV
Synergy	ISD BC 120/277

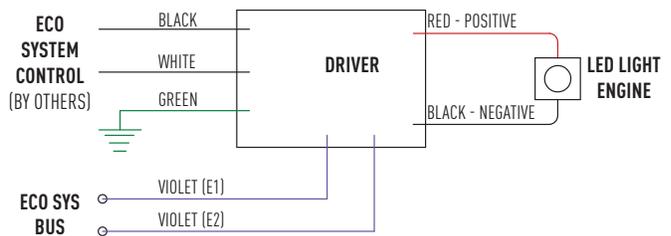


### LUTRON ECOSYSTEM® DIMMING

- 120V or 277V
- Dims down to less than 1% or 5% light output
- Consult dimming manufacturer for installation instructions

### COMPATIBLE DIMMERS

Product	Part Number(s)
EcoSystem	CS-1L-WM, CS-2L-WM, CS-1L-CM, CS-2L-CM, EcoSystem ESN, Grafik Eye QS with EcoSystem, Quantum



### LUTRON HI-LUME® DIMMING

- 120V or 277V
- Dims down to less than 1% light output
- Consult dimming manufacturer for installation instructions

### COMPATIBLE DIMMERS

Product	Part Number(s)
NovaT	NTF-10, NTF-103P, NTF-103P-277, NTF-10-277
Nova	NF-10, NF-103P, NF-103P-277, NF-10-277
Vareo	VF-10
Skylark	SF-10P, SF-12P-277, SF-12P-277-3, SF-103P
Diva	DVF-103, DVF-103P-277, DVSCF-103P, DVSCF-103P-277
Ariadni	AYF-103P, AYF-103P-277
Vierti	VTF-6AM
Maestro	MAF-6AM, MAF-6AM-277, MSCF-6AM, MCSF-6AM-277
Maestro Wireless	MRF2-F6AN-DV
Spacer System	SPSF-6A, SPSF-6A-277, SPSF-6AM, SPSF-6AM-277
Lyneo	LXF-103PL, LXF-103PL-277
Radio RA 2	RRD-F6AN-DV
HomeWorks QS	HQRD-F6AN-DV



Submitting Agency:



**SESCO Lighting**

702 Lindsay Place, Knoxville, TN 37919  
Tel: (865) 633-9288 Fax: (865) 633-9278

Description: **SS6G2-3000-358-???** IC635-HZ-SF

Project: **OAK RIDGE LIBRARY**

Notes:

Type:

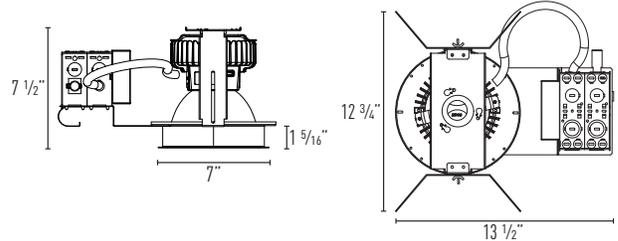
**CNWW**

# SS6G2 / IC635

6" Architectural LED Round Generation 2 / Wall Wash Reflector



JOB NAME		CATALOG NUMBER	
NOTES		TYPE	



Cut-out: 6 1/2"

Order Matrix | Example: SS6G22000308-27-EM

A	B	C	D	E
<b>A</b> Series			<b>D</b> Dimming	
<b>SS6G2</b> 6" LED Recessed Round			blank Non-Dimming -D10V1 0-10V Dimming 1% -D10V 0-10V Dimming 10% -ED10V1 eldoLED 0-10V 1% <sup>1</sup> -ED10V01 eldoLED 0-10V 0.1% <sup>1</sup> -LUT1 Lutron Hi-Lume 1% -LUT Lutron EcoSystem 1% -LUT5 Lutron EcoSystem 5% -EDALI1 eldoLED DALI 1% <sup>1</sup> -EDALI01 eldoLED DALI 0.1% <sup>1</sup>	
<b>B</b> Module Lumen Output			<b>E</b> Voltage	
1100 1100 Lumen 1500 1500 Lumen 2000 2000 Lumen <b>3000</b> 3000 Lumen			blank 120V 27 277V	
<b>C</b> Color Temperature / CRI			<b>E</b> Options	
278 2700K / 80 CRI 308 3000K / 80 CRI <b>358</b> 3500K / 80 CRI 408 4000K / 80 CRI			-EM Emergency Backup -I100 C-Channel Bar Hanger -I200 Flat Bar Hanger -I400 Wood Joist Bar Hanger	

Notes:

1. eldoLED dimming not available for 3000lm module

Reflector Matrix | Example: IC635HZ-SF

A	B	C
<b>A</b> Series		<b>C</b> Trim
<b>IC635</b> 6" Wall Wash Reflector		-SF Self Flanged -SFW Self Flanged White
<b>B</b> Reflector Finish		
Clear Haze <b>W</b> White		

Catalog Number	System Wattage *	Delivered Lumens **
SS6G21100358 / IC635C	15.75W	784lm @ 3500K
SS6G21500358 / IC635C	18.72W	1018lm @ 3500K
SS6G22000358 / IC635C	24.57W	1287lm @ 3500K
SS6G23000358 / IC635C	37.24W	1888lm @ 3500K

\* System wattage include driver and LED module consumption.

\*\* Delivered lumen output will vary depending on CCT.

**LED MODULE**

- Powered by OSRAM PrevaLED<sup>®</sup> Cube LED Module
- 50,000 hours at 70% lumen maintenance
- No heat, mercury or UV
- Available in 1100, 1500, 2000 and 3000 lm
- CRI = 80 & CCT 2700K, 3000K, 3500K, 4000K

**ELECTRICAL SYSTEM**

- Thermal protection guard protects the LED module from overheating and will dim LED module if necessary
- Power factor >.9, 50/60Hz
- Multiple dimming options available

**OPTICAL SYSTEM**

Innovative optical lens directs light at a 20° angle towards wall achieving uniform and even light distribution. Specification grade reflector with 1.2mm thickness. Reflector available in clear specular, haze or white. Architectural, discrete polished self flange standard. Optional painted white flange is available.

**FRAME CONSTRUCTION**

Heavy duty galvanized steel frame with a large access junction box. ETL listed for through wiring. LED light engine and driver are accessible from above or below ceiling.

**INSTALLATION**

The luminaire is type Non-IC. Insulation must be kept at a minimum of 3" away from fixture. Universal mounting brackets included. Compatible with C-channel, flat bar, wood joist bar hanger and EMT. Bar hangers must be ordered separately. C-channel are recommended for T-bar ceilings. Maximum ceiling thickness is 1 1/4".

**EMERGENCY BACKUP**

Remote test switch included. Emergency driver operates LED load of up to 7.0 Watts at a nominal 450 lumens for a minimum of 90 minutes.

**LISTING/WARRANTY**

- ETL listed to US and Canadian standards for wet locations.
- 10-Year Intense LED Limited Warranty

ARCHITECTURAL LUM-011134 P-21

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Note: Specifications and dimensions subject to change without notice.



Submitting Agency:



**SESCO Lighting**

702 Lindsay Place, Knoxville, TN 37919  
Tel: (865) 633-9288 Fax: (865) 633-9278

Description: **SS6G2-3000-358-??? IC635-HZ-SF**

Project: **OAK RIDGE LIBRARY**

Notes:

Type:

**CNWW**

JOB NAME		CATALOG NUMBER	
NOTES		TYPE	

## SS6G21100358 / IC635C

6" Architectural LED Round / Wall Wash Reflector

Report #: L10135502

Reflector Finish: Specular Clear

Luminaire Watts: 15.75W

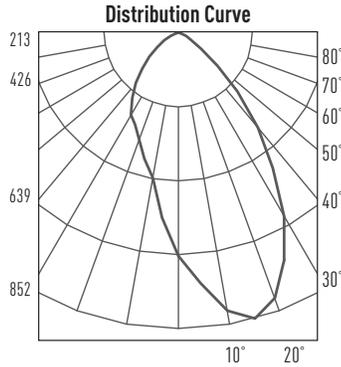
Luminaire Lumens: 783.67 lm

Lumens Per Watt: 49.76

Color Temperature: 3290K

Color Rendering Index: 84.3

Lighting Facts  
Reg. #: L5DN-A6MDI7



Distance From Ceiling	2' From Wall On 3' Centers	3' From Wall On 3' Centers	3' From Wall On 4' Centers
	□ 3' □	□ 3' □	□ 4' □
1'	5 3 5	1 1 1	1 1 1
2'	22 13 22	5 5 5	5 3 5
3'	24 21 24	11 11 11	10 7 10
4'	18 18 18	13 14 13	11 11 11
5'	13 13 13	12 13 12	10 10 10
6'	9 10 9	10 11 10	9 9 9
7'	6 7 6	8 8 8	7 7 7
8'	5 5 5	6 6 6	5 6 5
9'	3 4 3	5 5 5	4 5 4
10'	3 3 3	4 4 4	3 4 3
11'	2 2 2	3 3 3	3 3 3
12'	2 2 2	2 2 2	2 2 2
13'	1 1 1	2 2 2	2 2 2
14'	1 1 1	2 2 2	1 2 1



## SS6G21500358 / IC635C

6" Architectural LED Round / Wall Wash Reflector

Report #: L10135504

Reflector Finish: Specular Clear

Luminaire Watts: 18.72W

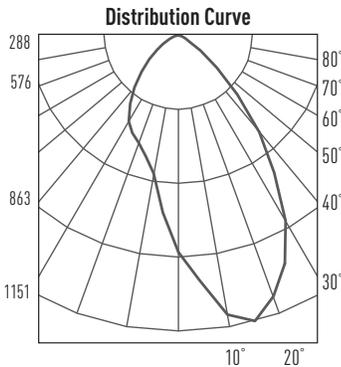
Luminaire Lumens: 1018.05 lm

Lumens Per Watt: 54.38

Color Temperature: 3290K

Color Rendering Index: 83

Lighting Facts  
Reg. #: L5DN-RCC85P



Distance From Ceiling	2' From Wall On 3' Centers	3' From Wall On 3' Centers	3' From Wall On 4' Centers
	□ 3' □	□ 3' □	□ 4' □
1'	7 4 7	1 1 1	1 1 1
2'	30 19 30	7 6 7	6 4 6
3'	33 28 33	15 15 15	14 10 14
4'	25 24 25	18 19 18	16 14 16
5'	17 18 17	16 17 16	14 14 14
6'	12 13 12	13 14 13	12 12 12
7'	8 9 8	10 11 10	9 10 9
8'	6 7 6	8 9 8	7 8 7
9'	4 5 4	6 7 6	5 6 5
10'	3 4 3	5 5 5	4 5 4
11'	3 3 3	4 4 4	4 4 4
12'	2 2 2	3 3 3	3 3 3
13'	2 2 2	3 3 3	2 3 2
14'	1 1 1	2 2 2	2 2 2



All testing was conducted in accordance with **LM-79-08**, Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products as published by the Illuminating Engineering Society of North America (IESNA).

ARCHITECTURAL LM-8011:14 P-22

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Note: Specifications and dimensions subject to change without notice.





JOB NAME		CATALOG NUMBER	
NOTES		TYPE	

**SS6G22000358 / IC635C**

6" Architectural LED Round / Wall Wash Reflector

Report #: L10135506

Reflector Finish: Specular Clear

Luminaire Watts: 24.57W

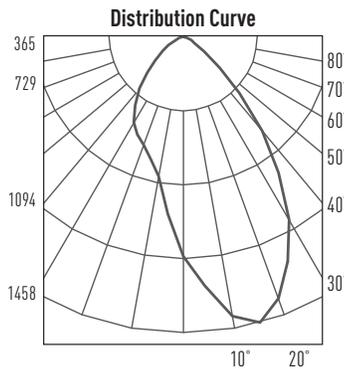
Luminaire Lumens: 1287.38 lm

Lumens Per Watt: 52.4

Color Temperature: 3310K

Color Rendering Index: 83.1

Lighting Facts  
Reg. #: L5DN-A2ZPBS



Distance From Ceiling	2' From Wall On 3' Centers	3' From Wall On 3' Centers	3' From Wall On 4' Centers
	□ 3' □	□ 3' □	□ 4' □
1'	9 5 9	2 1 2	1 1 1
2'	37 23 37	8 7 8	8 5 8
3'	41 35 41	18 18 18	17 12 17
4'	31 30 31	22 23 22	20 18 20
5'	21 22 21	20 22 20	18 17 18
6'	15 16 15	16 18 16	14 15 14
7'	11 12 11	13 14 13	11 12 11
8'	8 8 8	10 11 10	9 10 9
9'	6 6 6	8 9 8	7 8 7
10'	4 5 4	6 7 6	6 6 6
11'	3 4 3	5 5 5	4 5 4
12'	3 3 3	4 4 4	4 4 4
13'	2 2 2	3 3 3	3 3 3
14'	2 2 2	3 3 3	2 3 2

**SS6G23000358 / IC635C**

6" Architectural LED Round / Wall Wash Reflector

Report #: L10135508

Reflector Finish: Specular Clear

Luminaire Watts: 37.24W

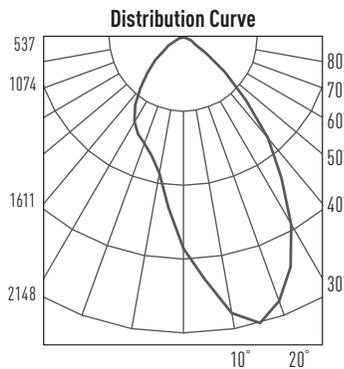
Luminaire Lumens: 1887.95 lm

Lumens Per Watt: 50.7

Color Temperature: 3250K

Color Rendering Index: 83.8

Lighting Facts  
Reg. #: L5DN-2T7TZO



Distance From Ceiling	2' From Wall On 3' Centers	3' From Wall On 3' Centers	3' From Wall On 4' Centers
	□ 3' □	□ 3' □	□ 4' □
1'	14 8 14	3 1 3	2 1 2
2'	60 37 60	14 6 14	13 8 13
3'	62 54 62	29 15 29	27 20 27
4'	46 44 46	34 19 34	30 27 30
5'	32 33 32	30 17 30	27 26 27
6'	22 24 22	24 14 24	22 22 22
7'	15 17 15	19 11 19	17 18 17
8'	11 12 11	15 9 15	13 14 13
9'	8 9 8	11 7 11	10 11 10
10'	6 7 6	9 5 9	8 9 8
11'	5 5 5	7 4 7	6 7 6
12'	4 4 4	6 3 6	5 6 5
13'	3 3 3	5 3 5	4 5 4
14'	2 3 2	4 2 4	3 4 3

All testing was conducted in accordance with **LM-79-08**, Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products as published by the Illuminating Engineering Society of North America (IESNA).

ARCHITECTURAL LM-8011:14 P-23

Intense Lighting, LLC | 3340. E La Palma Ave. | Anaheim, CA 92806 | Phone: 1.800.961.5321 | Fax: 1.800.961.5322 | www.intenselighting.com

Note: Specifications and dimensions subject to change without notice.





# DIMMING COMPATIBILITY

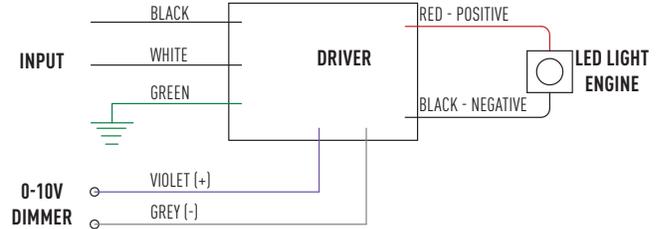
JOB NAME		CATALOG NUMBER	
NOTES		TYPE	

## 0-10V DIMMING

- 120V or 277V
- Dims down to 1% or 10% light output
- Consult dimming manufacturer for installation instructions and power packs

### COMPATIBLE DIMMERS

Manufacturer	Part Number(s)
HUNT	PS-010-IV-120V, PS-010-WH-120V, PS-010-3W-IV-120, PS-010-3W-WH-120V, PS-010-IV-277V, PS-010-WH-277V, PS-010-3W-IV-277V, PS-010-3W-WH-277V, FD-010: PS-IFC-010-IV, PS-IFC-010-WH-120/277V, FD-010: PS-IFC-010-3W-IV, PS-IFC-010-3W-WH-120/277V, FD-010-120V, FD-010-277V
Leviton	Leviton Centura Fluorescent Control System, IllumaTech™ IP7 Series, DPSPE-212
Lightolier	ZP600FAM120, MP1500FAM120, V2000FAMU
Lithonia	LEQ BC, LEQ LVBC, SLD LVBC, S01DC
Lutron	DVTV, NTFV
Synergy	ISD BC 120/277

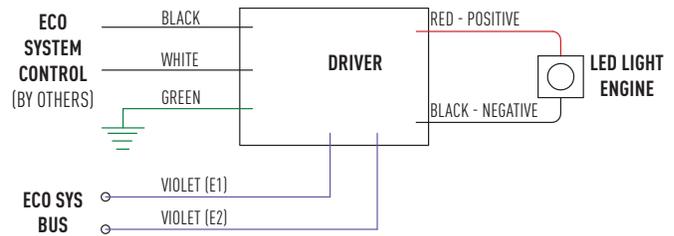


## LUTRON ECOSYSTEM® DIMMING

- 120V or 277V
- Dims down to less than 1% or 5% light output
- Consult dimming manufacturer for installation instructions

### COMPATIBLE DIMMERS

Product	Part Number(s)
EcoSystem	CS-1L-WM, CS-2L-WM, CS-1L-CM, CS-2L-CM, EcoSystem ESN, Grafik Eye QS with EcoSystem, Quantum



## LUTRON HI-LUME® DIMMING

- 120V or 277V
- Dims down to less than 1% light output
- Consult dimming manufacturer for installation instructions

### COMPATIBLE DIMMERS

Product	Part Number(s)
NovaT	NTF-10, NTF-103P, NTF-103P-277, NTF-10-277
Nova	NF-10, NF-103P, NF-103P-277, NF-10-277
Vareo	VF-10
Skylark	SF-10P, SF-12P-277, SF-12P-277-3, SF-103P
Diva	DVF-103, DVF-103P-277, DVSCF-103P, DVSCF-103P-277
Ariadni	AYF-103P, AYF-103P-277
Vierti	VTF-6AM
Maestro	MAF-6AM, MAF-6AM-277, MSCF-6AM, MCSF-6AM-277
Maestro Wireless	MRF2-F6AN-DV
Spacer System	SPSF-6A, SPSF-6A-277, SPSF-6AM, SPSF-6AM-277
Lyneo	LXF-103PL, LXF-103PL-277
Radio RA 2	RRD-F6AN-DV
HomeWorks QS	HORD-F6AN-DV



Submitting Agency:



**SESCO Lighting**

702 Lindsay Place, Knoxville, TN 37919  
Tel: (865) 633-9288 Fax: (865) 633-9278

Description: **SS8RG2-3000-358-???V IC830 HZ-SF**

Project: **OAK RIDGE LIBRARY**

Notes:

Type:

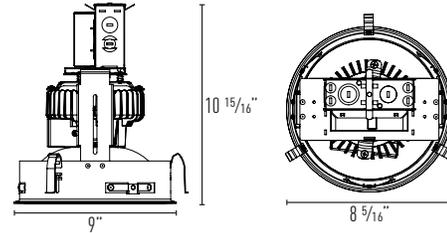
**CR**

# SS8RG2 / IC830

8" Architectural Remodel LED Round Generation 2 / Open Reflector



JOB NAME		CATALOG NUMBER	
NOTES		TYPE	



Cut-out: 8 1/8"

Order Matrix | Example: SS8RG22000308-27-EM

A	B	C	D	E
<b>A</b> Series			<b>D</b> Dimming	
<b>SS8RG2</b> 8" Remodel LED Recessed Round			blank Non-Dimming -D10V1 0-10V Dimming 1% -D10V 0-10V Dimming 10% -ED10V1 eldoLED 0-10V 1% <sup>1</sup> -ED10V01 eldoLED 0-10V 0.1% <sup>1</sup> -LUT1 Lutron Hi-Lume 1% -LUT Lutron EcoSystem 1% -LUT5 Lutron EcoSystem 5% -EDALI1 eldoLED DALI 1% <sup>1</sup> -EDALI01 eldoLED DALI 0.1% <sup>1</sup>	
<b>B</b> Module Lumen Output			<b>E</b> Voltage	
1100 1100 Lumen 1500 1500 Lumen 2000 2000 Lumen <b>3000</b> 3000 Lumen			blank 120V 27 277V	
<b>C</b> Color Temperature / CRI			<b>E</b> Option	
278 2700K / 80 CRI 308 3000K / 80 CRI <b>358</b> 3500K / 80 CRI 408 4000K / 80 CRI			-EM Emergency Backup	

Notes:

1. eldoLED dimming not available for 3000lm module

Reflector Matrix | Example: IC830HZ-SF

A	B	C
<b>A</b> Series		<b>C</b> Trim
<b>IC830</b> 8" Open Reflector		<b>-SF</b> Self Flanged <b>-SFW</b> Self Flanged White
<b>B</b> Reflector Finish		
<b>C</b> Clear <b>HZ</b> Haze <b>W</b> White		

Catalog Number	System Wattage *	Delivered Lumens **
<b>SS8RG21100358 / IC830C</b>	15.73W	1163lm @ 3500K
<b>SS8RG21500358 / IC830C</b>	18.78W	1530lm @ 3500K
<b>SS8RG22000358 / IC830C</b>	24.91W	1959lm @ 3500K
<b>SS8RG23000358 / IC830C</b>	37.48W	2956lm @ 3500K

\* System wattage include driver and LED module consumption.

\*\* Delivered lumen output will vary depending on CCT.

**LED MODULE**

- Powered by OSRAM PrevaLED<sup>®</sup> Cube LED Module
- 50,000 hours at 70% lumen maintenance
- No heat, mercury or UV
- Available in 1100, 1500, 2000 and 3000 lm
- CRI = 80 & CCT 2700K, 3000K, 3500K, 4000K

**ELECTRICAL SYSTEM**

- Thermal protection guard protects the LED module from overheating and will dim LED module if necessary
- Power factor >.9, 50/60Hz
- Multiple dimming options available

**OPTICAL SYSTEM**

Specification grade reflector with 1.2mm thickness. Reflector available in clear specular, haze or white. Architectural, discrete polished self flange standard. Optional painted white flange is available. Meets RP-1 requirements with controlled light distribution at a 55° cut off.

**FRAME CONSTRUCTION**

Heavy duty galvanized steel frame with a large access junction box. ETL listed for through wiring. LED light engine and driver are accessible from above or below ceiling.

**INSTALLATION**

Three high tensions springs secure fixture into ceiling with up to 5/8" thickness.

**EMERGENCY BACKUP**

Remote test switch included. Emergency driver operates LED load of up to 7.0 Watts at a nominal 450 lumens for a minimum of 90 minutes.

**LISTING/WARRANTY**

- ETL listed to US and Canadian standards for damp locations.
- 10-Year Intense LED Limited Warranty

ARCHITECTURAL LUM-011014P-01

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Note: Specifications and dimensions subject to change without notice.





JOB NAME		CATALOG NUMBER	
NOTES		TYPE	

**SS8RG21100358 / IC830C**

8" Architectural LED Round / Open Reflector

Report #: L10135705

Reflector Finish: Specular Clear

Luminaire Watts: 15.73W

Luminaire Lumens: 1162.61 lm

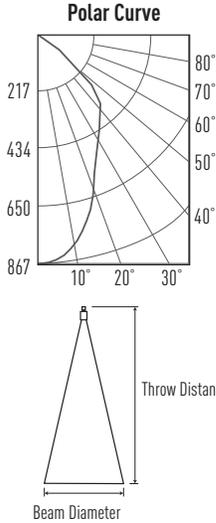
Lumens Per Watt: 73.91

Color Temperature: 3340K

Color Rendering Index: 84.7

Spacing Criteria: 0.86

Lighting Facts Reg. #: L5DN-8VRH5D



Throw Distance (d)	8' (2.4m)	10' (3m)	12' (3.7m)
Beam Diameter	6.9' (2.1m)	8.5' (2.6m)	10.3' (3.1m)
Illuminance (fc)	13.5	8.7	6
Illuminance (lux)	146	93.3	64.8

**Coefficients of Utilization**

Effective Floor Cavity Reflectance = .20

RC	80				70				50				30				0
	Wall Reflectance																
RW	70	50	30	10	70	50	30	10	70	50	30	10	70	50	30	10	0
1	112	108	105	102	109	106	103	100	102	99	97	98	96	94	90	90	
2	104	98	92	88	102	96	91	87	92	88	85	89	86	83	79	79	
3	97	88	82	77	94	87	81	76	84	79	75	81	77	73	70	70	
4	90	80	73	67	88	79	72	67	77	71	66	74	69	65	63	63	
5	84	73	65	60	82	72	65	60	70	64	59	68	63	58	56	56	
6	78	67	59	54	76	66	59	54	64	58	53	63	57	53	51	51	
7	73	61	54	49	71	61	53	48	59	53	48	58	52	48	46	46	
8	69	57	49	44	67	56	49	44	55	48	44	54	48	44	42	42	
9	64	53	45	40	63	52	45	40	51	45	40	50	44	40	38	38	
10	61	49	42	37	60	48	42	37	48	41	37	47	41	37	35	35	

**Zonal Lumens and Percentages**

Zone	Lumens	%Fixture
0-30	502.47	43.2
0-40	721.88	62.1
0-60	1099.85	94.6
0-90	1162.61	100
40-70	429.66	37
60-80	57.35	57.35
90-180	0	0
0-180	1162.61	100

**Zonal Lumen Summary**

Zone	CP	Lumens
0	867	65.42
10	808	206.12
20	628	230.93
30	462	219.41
40	374	255.22
50	221	122.75
60	55	51.69
70	6	5.66
80	4	5.41
90	0	0

**SS8RG21500358 / IC830C**

8" Architectural LED Round / Open Reflector

Report #: L10135706

Reflector Finish: Specular Clear

Luminaire Watts: 18.78W

Luminaire Lumens: 1530.38 lm

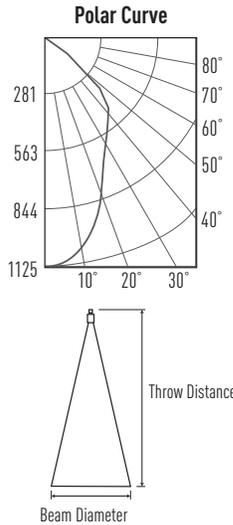
Lumens Per Watt: 81.49

Color Temperature: 3370K

Color Rendering Index: 83.9

Spacing Criteria: 0.88

Lighting Facts Reg. #: L5DN-HCX7TC



Throw Distance (d)	8' (2.4m)	10' (3m)	12' (3.7m)
Beam Diameter	6.9' (2.1m)	8.6' (2.6m)	10.4' (3.2m)
Illuminance (fc)	17.6	11.3	7.8
Illuminance (lux)	189	121	84.1

**Coefficients of Utilization**

Effective Floor Cavity Reflectance = .20

RC	80				70				50				30				0
	Wall Reflectance																
RW	70	50	30	10	70	50	30	10	70	50	30	10	70	50	30	10	0
1	112	108	105	102	109	106	103	100	102	99	97	98	96	94	90	90	
2	104	98	92	88	102	96	91	87	92	88	85	89	86	83	79	79	
3	97	88	82	77	94	87	81	76	84	79	75	81	77	73	70	70	
4	90	80	73	67	88	79	72	67	77	71	66	74	69	65	63	63	
5	84	73	65	60	82	72	65	60	70	64	59	68	63	58	56	56	
6	78	67	59	54	76	66	59	53	64	58	53	63	57	53	50	50	
7	73	61	54	48	71	61	53	48	59	53	48	58	52	48	46	46	
8	68	57	49	44	67	56	49	44	55	48	44	54	48	44	42	42	
9	64	52	45	40	63	52	45	40	51	44	40	50	44	40	38	38	
10	61	49	42	37	59	48	42	37	47	41	37	47	41	37	35	35	

**Zonal Lumens and Percentages**

Zone	Lumens	%Fixture
0-30	656.99	42.9
0-40	945.85	61.8
0-60	1445.99	94.5
0-90	1530.38	100
40-70	570.32	37.3
60-80	77.91	5.1
90-180	0	0
0-180	1530.38	100

**Zonal Lumen Summary**

Zone	CP	Lumens
0	1125	84.92
10	1051	268.98
20	824	303.09
30	608	288.87
40	493	336.68
50	294	163.45
60	74	70.19
70	8	7.72
80	5	6.49
90	0	0

All testing was conducted in accordance with LM-79-08, Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products as published by the Illuminating Engineering Society of North America (IESNA).

ARCHITECTURAL LM-80-14P-22

Intense Lighting, LLC | 3340, E La Palma Ave. | Anaheim, CA 92806 | Phone: 1.800.961.5321 | Fax: 1.800.961.5322 | www.intenselighting.com

Note: Specifications and dimensions subject to change without notice.





JOB NAME		CATALOG NUMBER	
NOTES		TYPE	

**SS8RG22000358 / IC830C**

8" Architectural LED Round / Open Reflector

Report #: L10135707

Reflector Finish: Specular Clear

Luminaire Watts: 24.91W

Luminaire Lumens: 1959.31 lm

Lumens Per Watt: 78.66

Color Temperature: 3370K

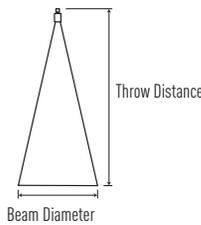
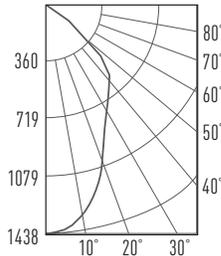
Color Rendering Index: 83.9

Spacing Criteria: 0.88

Lighting Facts Reg. #: L5DN-XE6FIM



Polar Curve



Throw Distance (d)	8' (2.4m)	10' (3m)	12' (3.7m)
Beam Diameter	6.9' (2.1m)	8.6' (2.6m)	10.4' (3.2m)
Illuminance (fc)	13.5	14.4	10
Illuminance (lux)	242	155	108

Coefficients of Utilization

Effective Floor Cavity Reflectance = .20

RC	80				70				50				30				0
	Wall Reflectance																
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	0	0	
1	112	108	105	102	109	106	103	100	102	99	97	98	96	94	90	90	
2	104	98	92	88	102	96	91	87	92	88	85	89	86	83	79	79	
3	97	88	82	76	94	87	81	76	84	79	75	81	77	73	70	70	
4	90	80	73	67	88	79	72	67	76	71	66	74	69	65	62	62	
5	84	73	65	60	82	72	65	59	70	64	59	68	63	58	56	56	
6	78	67	59	54	76	66	59	53	64	58	53	62	57	52	50	50	
7	73	61	54	48	71	60	53	48	59	53	48	58	52	48	46	46	
8	68	56	49	44	67	56	49	44	55	48	44	53	48	43	41	41	
9	64	52	45	40	63	52	45	40	51	44	40	50	44	40	38	38	
10	61	49	42	37	59	48	41	37	47	41	37	46	41	36	35	35	

Zonal Lumens and Percentages

Zone	Lumens	%Fixture
0-30	839.93	42.9
0-40	1208.41	61.7
0-60	1849.29	94.4
0-90	1959.31	100
40-70	731.93	37.4
60-80	100.83	5.1
90-180	0	0
0-180	1959.31	100

Zonal Lumen Summary

Zone	CP	Lumens
0	1438	108.5
10	1342	343.72
20	1052	387.71
30	776	368.48
40	630	430.32
50	378	210.56
60	96	91.06
70	10	9.78
80	7	9.19
90	0	0

**SS8RG23000358 / IC830C**

8" Architectural LED Round / Open Reflector

Report #: L10135708

Reflector Finish: Specular Clear

Luminaire Watts: 37.48W

Luminaire Lumens: 2956.45 lm

Lumens Per Watt: 78.88

Color Temperature: 3290K

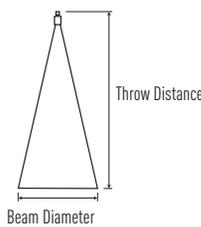
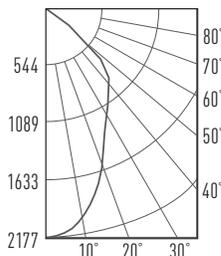
Color Rendering Index: 83.3

Spacing Criteria: 0.88

Lighting Facts Reg. #: L5DN-LNSQJL



Polar Curve



Throw Distance (d)	8' (2.4m)	10' (3m)	12' (3.7m)
Beam Diameter	6.9' (2.1m)	8.6' (2.6m)	10.4' (3.2m)
Illuminance (fc)	34	21.8	15.1
Illuminance (lux)	366	234	163

Coefficients of Utilization

Effective Floor Cavity Reflectance = .20

RC	80				70				50				30				0
	Wall Reflectance																
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	0	0	
1	112	108	105	102	109	106	103	100	102	99	97	98	96	94	90	90	
2	104	98	92	88	101	96	91	87	92	88	85	89	86	83	79	79	
3	97	88	82	76	94	87	81	76	84	79	74	81	77	73	70	70	
4	90	80	73	67	88	79	72	67	76	71	66	74	69	65	62	62	
5	84	73	65	60	82	72	65	59	70	64	59	68	62	58	56	56	
6	78	67	59	53	76	66	58	53	64	58	53	62	57	52	50	50	
7	73	61	54	48	71	60	53	48	59	53	48	58	52	47	45	45	
8	68	56	49	44	67	56	49	44	55	48	44	53	48	43	41	41	
9	64	52	45	40	63	52	45	40	51	44	40	50	44	40	38	38	
10	61	49	42	37	59	48	41	37	47	41	37	46	41	37	35	35	

Zonal Lumens and Percentages

Zone	Lumens	%Fixture
0-30	1265.67	42.8
0-40	1821.68	61.6
0-60	2787.36	94.3
0-90	2956.45	100
40-70	1106.07	37.4
60-80	155.3	5.3
90-180	0	0
0-180	2956.45	100

Zonal Lumen Summary

Zone	CP	Lumens
0	2177	164
10	2024	517.13
20	1583	584.54
30	1171	556
40	946	646.48
50	571	319.2
60	148	140.38
70	15	14.92
80	11	13.79
90	0	0

All testing was conducted in accordance with LM-79-08, Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products as published by the Illuminating Engineering Society of North America (IESNA).

ARCHITECTURAL LM-80-14P-33

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# DIMMING COMPATIBILITY

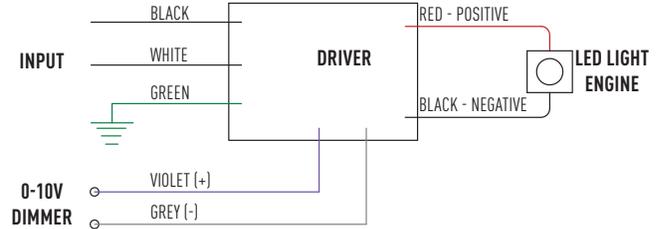
JOB NAME		CATALOG NUMBER	
NOTES		TYPE	

### 0-10V DIMMING

- 120V or 277V
- Dims down to 1% or 10% light output
- Consult dimming manufacturer for installation instructions and power packs

### COMPATIBLE DIMMERS

Manufacturer	Part Number(s)
HUNT	PS-010-IV-120V, PS-010-WH-120V, PS-010-3W-IV-120, PS-010-3W-WH-120V, PS-010-IV-277V, PS-010-WH-277V, PS-010-3W-IV-277V, PS-010-3W-WH-277V, FD-010: PS-IFC-010-IV, PS-IFC-010-WH-120/277V, FD-010: PS-IFC-010-3W-IV, PS-IFC-010-3W-WH-120/277V, FD-010-120V, FD-010-277V
Leviton	Leviton Centura Fluorescent Control System, Illumatech™ IP7 Series, DPSPE-212
Lightolier	ZP600FAM120, MP1500FAM120, V2000FAMU
Lithonia	LEQ BC, LEQ LVBC, SLD LVBC, S01DC
Lutron	DVTV, NTFV
Synergy	ISD BC 120/277

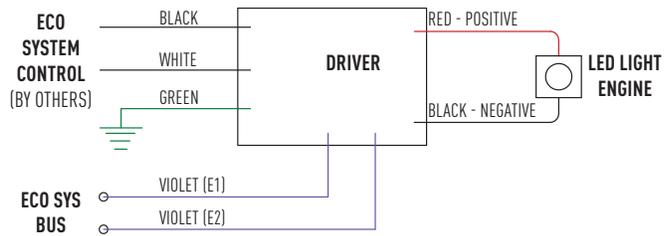


### LUTRON ECOSYSTEM® DIMMING

- 120V or 277V
- Dims down to less than 1% or 5% light output
- Consult dimming manufacturer for installation instructions

### COMPATIBLE DIMMERS

Product	Part Number(s)
EcoSystem	CS-1L-WM, CS-2L-WM, CS-1L-CM, CS-2L-CM, EcoSystem ESN, Grafik Eye QS with EcoSystem, Quantum



### LUTRON HI-LUME® DIMMING

- 120V or 277V
- Dims down to less than 1% light output
- Consult dimming manufacturer for installation instructions

### COMPATIBLE DIMMERS

Product	Part Number(s)
NovaT	NTF-10, NTF-103P, NTF-103P-277, NTF-10-277
Nova	NF-10, NF-103P, NF-103P-277, NF-10-277
Vareo	VF-10
Skylark	SF-10P, SF-12P-277, SF-12P-277-3, SF-103P
Diva	DVF-103, DVF-103P-277, DVSCF-103P, DVSCF-103P-277
Ariadni	AYF-103P, AYF-103P-277
Vierti	VTF-6AM
Maestro	MAF-6AM, MAF-6AM-277, MSCF-6AM, MCSF-6AM-277
Maestro Wireless	MRF2-F6AN-DV
Spacer System	SPSF-6A, SPSF-6A-277, SPSF-6AM, SPSF-6AM-277
Lyneo	LXF-103PL, LXF-103PL-277
Radio RA 2	RRD-F6AN-DV
HomeWorks QS	HQRD-F6AN-DV





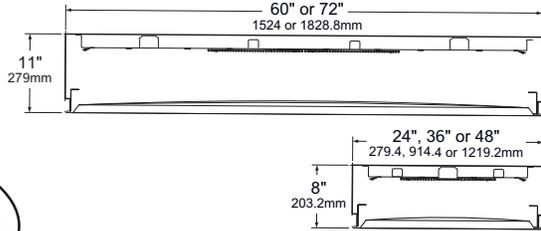
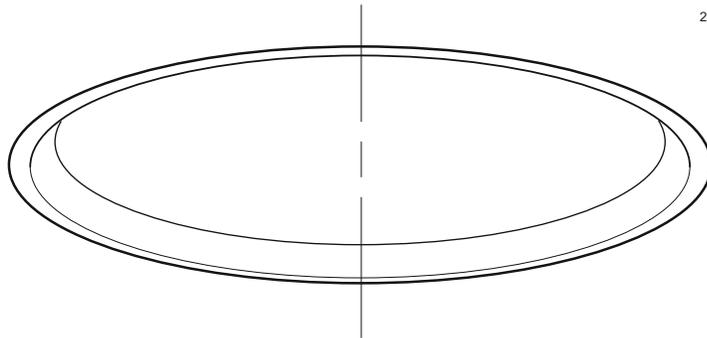


Type  
Job Name  
Catalog Number



Made in USA

**P8900 LED Transcendent**



**ordering - P8900 LED**

series	lamp rows	shielding	color/finish*	circuiting	voltage	ceiling system	controls/options	
P8912 12" dia.	LED3LO, 3SO, 3HO <sup>†</sup> 3000k	CWA concave white acrylic (standard)	TMW textured matte white (standard)	SC single circuit	120	X1 exposed T-Bar	ND non dimming standard	DMD DALI dimming
P8920 2' dia.	LED35LO, 35SO, 35HO <sup>†</sup> 3500k			DC dual circuit	277 347	X1T T-Bar ceiling with tegular panels	DM10 0-10v 10% dimming	EMH <sup>†</sup> emergency battery (1100- 1200 raw lumens)
P8930 3' dia.	LED4LO, 4SO, 4HO <sup>†</sup> 4000k	VWA convex white acrylic	YGW gloss white		UNV 120-277		DM01 0-10v 1% dimming	EML <sup>†</sup> emergency battery (350-600 raw lumens)
P8940 4' dia.	<sup>†</sup> LO-Low Output, SO- Standard Output, HO-High Output	FWA flat white acrylic (6' size N/A)	Y_ premium color			X3B hard ceiling	STEP step dimming 100-50-off	<sup>†</sup> Consult factory for diameters <4'
P8950 5' dia.			CC custom color				DML 1% Lutron dimming	
P8960 6' dia.								

\*indicates color of outer ring only

**Features** A round recessed luminaire with a housing depth that ensures even lens illumination. This fixture is ideal for spaces where non-traditional fixtures are desired to amplify the architectural design. The extruded aluminum door frame gives the fixture strength and clean architectural detailing. Concave, convex or flat lenses are available. See also P9000.

**Construction** Extruded aluminum housing rolled and welded.

**Finish** The standard exterior body color is gloss white (YGW) or optional textured matte white (TMW) using polyester paint.

**Electrical** Must specify LED dimming controls. LED fixtures have constant current driver(s) with less than 20% THD when loaded to a minimum of 60%. Drivers sink a maximum of 6mA per driver. DM10 and DM01 LED drivers are 0-10V dimmable and are compatible with most 0-10V wall slide dimmers and direct 0-10V analog signal dimmers. Recommended wall dimmer is Leviton IP710 or equivalent. See data sheet to confirm all specified dimmers meet require specifications. Fixtures are ETL Damp labeled and I.B.E.W. manufactured For maximum driver size consult factory.

**Mounting** Fixture is to be recess-mounted into exposed T-bar or hard ceiling applications.

Prudential reserves the right to change design specifications or materials without notice.



Transcendent **P8900 LED**

**photometric data**

**P8930-LED3LO-FWA**

Report # LTL359805 D=100% I=0.0%  
Spacing Criteria: Along 1.2; Across 1.2

Delivered Lumens: 4520

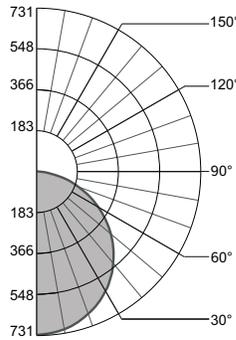
Input Watts: 66

Lumens/Watt: 68

Calculated L70 ≥ 100,000 hours

Reported L70 (6k) ≥ 36,000 hours

5 year LED warranty - see prulite.com



**Zonal Lumen Summary**

Zone%	Lumens	% Luminaire
0-90	4520	100.00
90-180	0.00	0.00

**Candlepower Summary**

Angle	Mean CP	Lumens
0	1604	
5	1596	154
10	1573	
15	1535	432
20	1482	
25	1415	651
30	1337	
35	1248	779
40	1149	
45	1043	803
50	929	
55	809	722
60	685	
65	558	551
70	430	
75	307	325
80	192	
85	92	104
90	11	

**Coefficients of Utilization (%)**

	effective floor cavity reflectance = .20														
	Floor					Ceiling					Wall				
	80	70	50	30	10	80	70	50	30	10	80	70	50	30	10
0	119	119	119	119	119	116	116	116	116	111	111	111	111	111	111
1	109	105	101	97	107	103	99	95	98	95	92	88	85	82	78
2	100	93	86	81	98	91	85	80	87	82	78	73	68	64	60
3	92	82	74	68	89	80	73	67	77	71	66	61	56	52	48
4	85	73	65	59	82	72	64	58	69	63	57	52	47	43	39
5	78	66	57	50	76	64	56	50	62	55	50	45	40	36	32
6	72	59	50	44	70	58	49	44	56	49	43	38	33	29	25
7	66	53	44	38	64	52	44	38	50	43	38	33	28	24	20
8	61	48	39	34	60	47	39	33	46	38	33	28	23	19	15
9	57	44	35	30	55	43	35	30	42	34	29	24	19	15	11
10	53	40	31	26	51	39	31	26	38	31	26	21	16	12	8



**Prudential LEDs**

**PruBin™** is Prudential Lighting's exclusive 'job binning' method that ensures color temperature consistency across all luminaires on a project. Meticulously testing and labeling EVERY LED board to +/- 25 lumens, +/- 50k CCT and +/- .004 Duv — while also separating positive from negative — allows us to match color, hue and intensity throughout a project and provides a consistent color temperature within a 2-step MacAdam ellipse.

**LED Delivered Lumens and Watts**

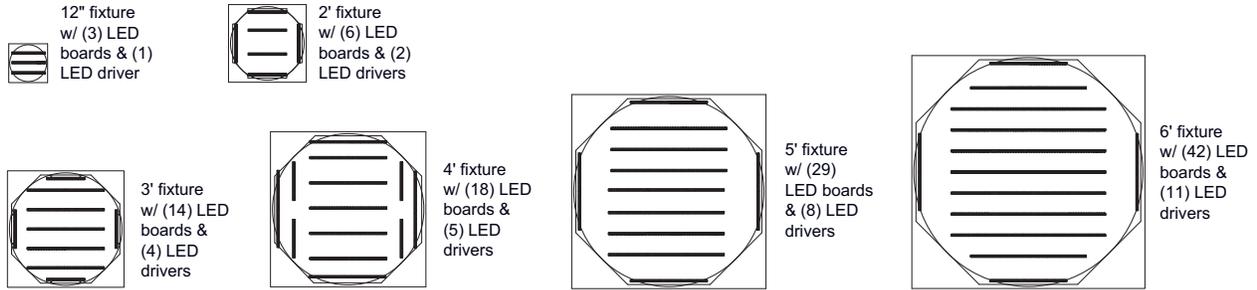
P8900	LED LO	LED SO	LED HO
P8912	629 Lm 15 w	1213 Lm 27 w	1458 Lm 34 w
P8920	1395 Lm 29 w	2825 Lm 59 w	3337 Lm 70 w
P8930	4520 Lm 66 w	8916 Lm 138 w	10,500 Lm 164 w
P8940	6449 Lm 87 w	12,454 Lm 178 w	14,963 Lm 211 w
P8950	9000 Lm 143 w	24,505 Lm 286 w	27,500 Lm 340 w
P8960	13,000 Lm 208 w	24,358 Lm 415 w	31,000 Lm 492 w

Lumen output and wattages are nominal for all 3 color changes and may vary +/- 5%.



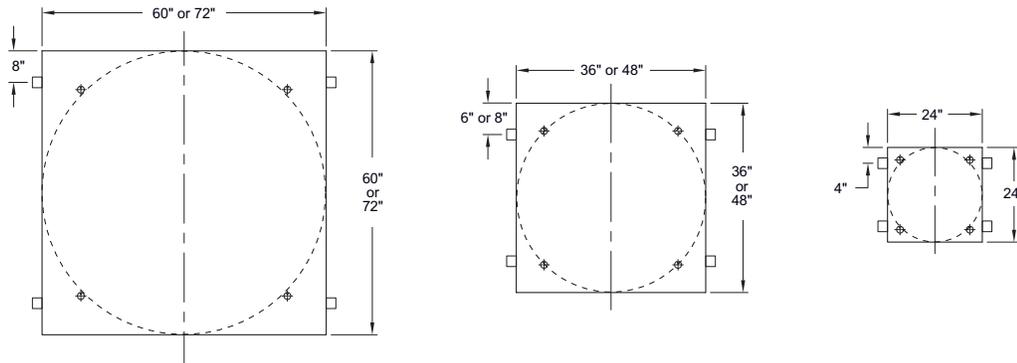
# P8900 LED Transcendent

## Details - Lamping Options

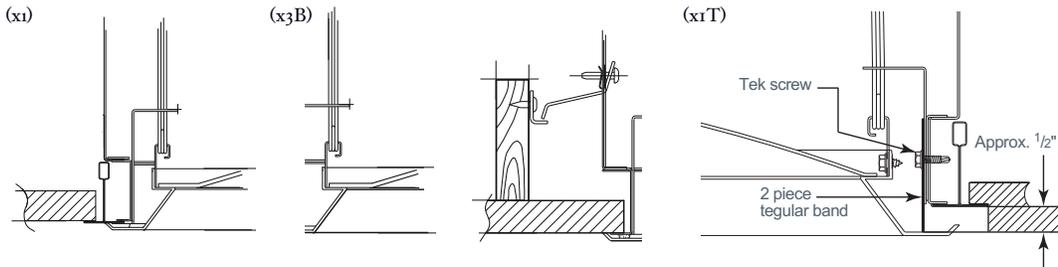


## Installation

Mounting Locations – Fixture must be installed prior to ceiling installation



## Ceiling Systems



Prudential reserves the right to change design specifications or materials without notice.

Submitting Agency:



**SESCO Lighting**

702 Lindsay Place, Knoxville, TN 37919  
Tel: (865) 633-9288 Fax: (865) 633-9278

Description: **P-8960-LED35SO-CWA-TMW-SC-UNV-X1-DM10**

Project: **OAK RIDGE LIBRARY**

Notes:

Type:

**D6**

Type

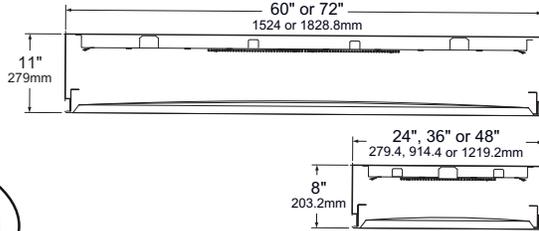
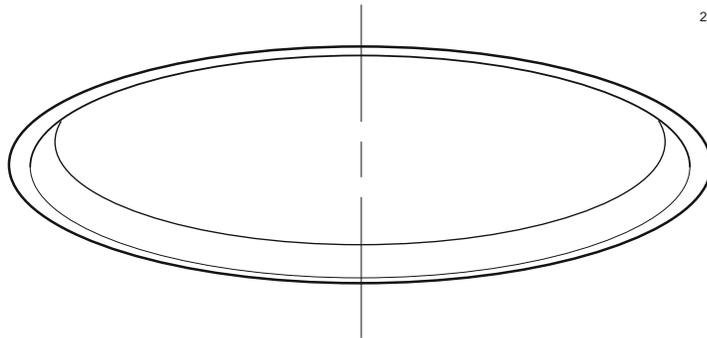
Job Name

Catalog Number



Made in USA

# P8900 LED Transcendent



## ordering - P8900 LED

series	lamp rows	shielding	color/finish*	circuiting	voltage	ceiling system	controls/options	
P8912 12" dia.	LED3LO, 3SO, 3HO 3000k	<b>CWA</b> concave white acrylic (standard)	<b>TMW</b> textured matte white (standard)	<b>SC</b> single circuit	120 277	<b>X1</b> exposed T-Bar	ND non-dimming standard	DMD DALI dimming
P8920 2' dia.	<b>LED35LO, 35SO, 35HO</b> 3500k			<b>DC</b> dual circuit	347 <b>JNV</b> 120-277	X1T T-Bar ceiling with tegular panels	<b>DM10</b> 0-10v 10% dimming	<b>EMH</b> emergency battery (1100- 1200 raw lumens)
P8930 3' dia.	LED4LO, 4SO, 4HO 4000k	<b>VWA</b> convex white acrylic	<b>YGW</b> gloss white				<b>DM01</b> 0-10v 1% dimming	<b>EML</b> emergency battery (350-600 raw lumens)
P8940 4' dia.	*LO-Low Output, SO- Standard Output, HO-High Output	<b>FWA</b> flat white acrylic (6' size N/A)	<b>Y_</b> premium color			<b>X3B</b> hard ceiling	<b>STEP</b> step dimming 100-50-off	*Consult factory for diameters <4'
P8950 5' dia.			<b>CC</b> custom color				<b>DML</b> 1% Lutron dimming	
<b>P8960</b> 6' dia.								

**Features** A round recessed luminaire with a housing depth that ensures even lens illumination. This fixture is ideal for spaces where non-traditional fixtures are desired to amplify the architectural design. The extruded aluminum door frame gives the fixture strength and clean architectural detailing. Concave, convex or flat lenses are available. See also P9000.

**Construction** Extruded aluminum housing rolled and welded.

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**Electrical** Must specify LED dimming controls. LED fixtures have constant current driver(s) with less than 20% THD when loaded to a minimum of 60%. Drivers sink a maximum of 6mA per driver. DM10 and DM01 LED drivers are 0-10V dimmable and are compatible with most 0-10V wall slide dimmers and direct 0-10V analog signal dimmers. Recommended wall dimmer is Leviton IP710 or equivalent. See data sheet to confirm all specified dimmers meet require specifications. Fixtures are ETL Damp labeled and I.B.E.W. manufactured For maximum driver size consult factory.

**Mounting** Fixture is to be recess-mounted into exposed T-bar or hard ceiling applications.

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Transcendent **P8900 LED**

**photometric data**

**P8930-LED3LO-FWA**

Report # LTL359805 D=100% I=0.0%  
Spacing Criteria: Along 1.2; Across 1.2

Delivered Lumens: 4520

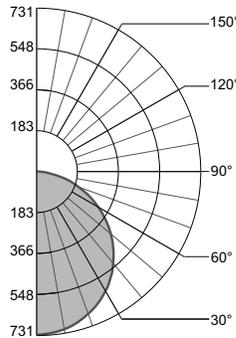
Input Watts: 66

Lumens/Watt: 68

Calculated L70 ≥ 100,000 hours

Reported L70 (6k) ≥ 36,000 hours

5 year LED warranty - see prulite.com



**Zonal Lumen Summary**

Zone%	Lumens	% Luminaire
0-90	4520	100.00
90-180	0.00	0.00

**Candlepower Summary**

Angle	Mean CP	Lumens
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25	1415	651
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35	1248	779
40	1149	
45	1043	803
50	929	
55	809	722
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65	558	551
70	430	
75	307	325
80	192	
85	92	104
90	11	

**Coefficients of Utilization (%)**

	effective floor cavity reflectance = .20																	
	Floor			Ceiling			Wall			80			70			50		
0	119	119	119	119	119	119	116	116	116	116	116	116	111	111	111	111	111	111
1	109	105	101	97	107	103	99	95	95	95	95	95	92	92	92	92	92	92
2	100	93	86	81	98	91	85	80	80	87	82	78	78	77	77	77	77	77
3	92	82	74	68	89	80	73	67	67	77	71	66	66	66	66	66	66	66
4	85	73	65	59	82	72	64	58	58	69	63	57	57	57	57	57	57	57
5	78	66	57	50	76	64	56	50	50	62	55	50	50	50	50	50	50	50
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10	53	40	31	26	51	39	31	26	26	38	31	26	26	26	26	26	26	26



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**PruBin™** is Prudential Lighting's exclusive 'job binning' method that ensures color temperature consistency across all luminaires on a project. Meticulously testing and labeling EVERY LED board to +/- 25 lumens, +/- 50k CCT and +/- .004 Duv — while also separating positive from negative — allows us to match color, hue and intensity throughout a project and provides a consistent color temperature within a 2-step MacAdam ellipse.

**LED Delivered Lumens and Watts**

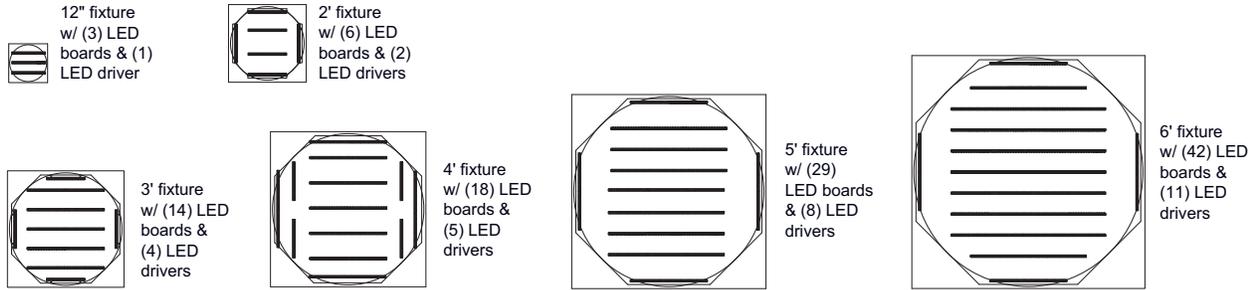
P8900	LED LO	LED SO	LED HO
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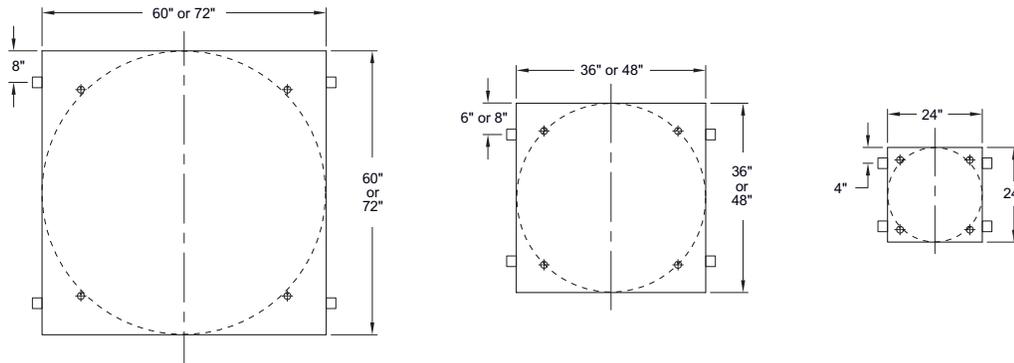
# P8900 LED Transcendent

## Details - Lamping Options

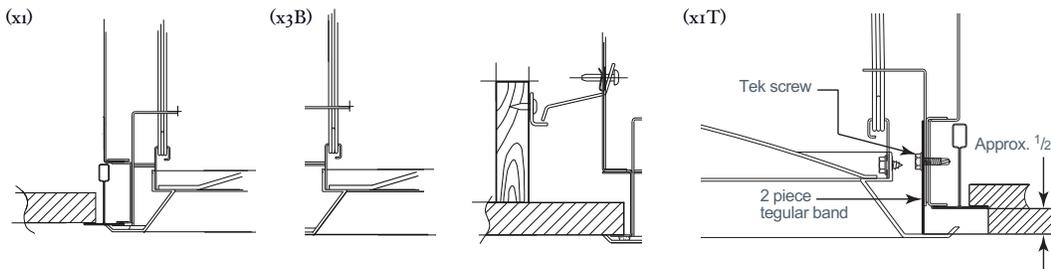


## Installation

Mounting Locations – Fixture must be installed prior to ceiling installation



## Ceiling Systems



Prudential reserves the right to change design specifications or materials without notice.



**LED STRIP**

**75**

**SUBMITTAL:**

**LED**

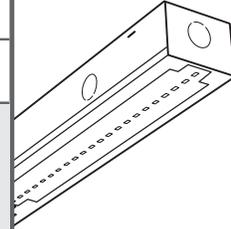
**JOB:**

**TYPE:**

**VOLTAGE:**

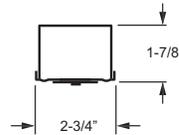
EXAMPLE **75 - 4 - LED\*PH85/840 - OPTIONS - EDD\*PH - UNV**

SERIES      NOMINAL LENGTH      LED PACKAGE      OPTIONS/ACCESSORIES      DRIVER      VOLTAGE



**FEATURES**

- ▶ Small fixture profile allows inconspicuous placement in coves or confined spaces.
- ▶ Row applications produce continuous light with minimal interruption between fixtures.
- ▶ LED technology provides high efficacy and energy efficiency.
- ▶ Power and light levels can be custom set to meet energy and design needs in applications ranging from coves to high-ceiling common areas.
- ▶ Multiple dimming protocols available.
- ▶ Rated for 50,000 hours at 70% lumen maintenance (L70).
- ▶ Minimum 80 CRI; 3000K, 3500K, 4000K CCT.
- ▶ Special reflectors are available to provide precise light distribution.
- ▶ This fixture is proudly made in the USA.



**SPECIFICATIONS**

**Housing** – 22-gauge die-formed C.R.S.  
**Finish** – 92% minimum average reflective white polyester powder coat bonded to phosphate-free, multi-stage pretreated metal. All parts painted after fabrication to facilitate installation, increase efficiency, and inhibit corrosion.  
**LED Module** – Philips Fortimo LED light engine.  
**LED Driver** – Constant current, Class 2 driver. Philips and Lutron drivers available, see back for details.  
**Mounting** – Surface or suspended.  
**Labels** – cETLus conforms to UL STD 1598. Certified to CAN/CSA STD C22.2 No. 250.0. Suitable for damp locations.  
**Warranty** – 5-year limited fixture warranty, see www.hewilliams.com.

**ORDERING INFORMATION**

**SERIES**

**75** LED Strip

**NOMINAL LENGTH**

**2**      2'  
**4**      4'  
**8**      8'

**LED PACKAGE**

EXAMPLE: LED*PH85/835			
LUMEN PACKAGE	NOMINAL LUMENS	MAX. SYSTEM WATTAGE	MINIMUM CRI & CCT
<b>2' LUMEN PACKAGES</b>			
LED*PH15/1	1,500	12	<b>830</b> = 80 CRI, 3000K <b>835</b> = 80 CRI, 3500K <b>840</b> = 80 CRI, 4000K
LED*PH20/1	2,000	20	
LED*PH30/1	3,000	24	
LED*PH40/1	4,000	33	
<b>4' LUMEN PACKAGES</b>			
LED*PH30/1	3,000	23	<b>830</b> = 80 CRI, 3000K <b>835</b> = 80 CRI, 3500K <b>840</b> = 80 CRI, 4000K
LED*PH50/1	5,000	44	
LED*PH65/1	6,500	49	
LED*PH85/1	8,500	73	
<b>8' LUMEN PACKAGES</b>			
LED*PH60/1	6,000	43	<b>830</b> = 80 CRI, 3000K <b>835</b> = 80 CRI, 3500K <b>840</b> = 80 CRI, 4000K
LED*PH100/1	10,000	77	
LED*PH130/1	13,000	97	
LED*PH170/1	17,000	146	

Additional LED packages ranging from 1,500-4,000 (2' units), 3,000-8,500 (4' units), and 6,000-17,000 (8' units) lumens available, consult factory.

**OPTIONS**

**EM/BSL310** Emergency LED driver (nominal 1300 lumens module output in EM mode; 4' and 8' only)

**ACCESSORIES** (ordered separately)

See back for **special reflectors**, ordered separately.  
**WG-7511-LED** 11-gauge white powder coat wireguard  
**WG-7514-LED** 14-gauge white powder coat wireguard  
**315** 1-1/2" ceiling spacer  
**VBV** (2) Y-hangers  
**VBV-2** (2) Y-hangers and (2) 2' chains

**DRIVER**

Philips and Lutron drivers available, see back for details.

**VOLTAGE**

**120**      120V  
**277**      277V  
**UNV**      120-277V

<sup>1</sup> Not available with EDD\*PH\*DALI, EDSD40\*PH, or EDD\*PH\*MKX.



**75**

**LED STRIP**

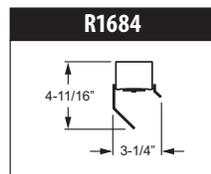
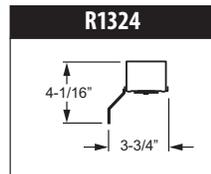
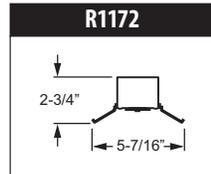
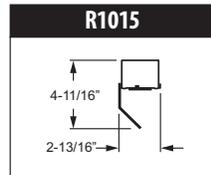
**LED**

**SPECIAL REFLECTORS**

Reflectors are ordered separately.

**Example:**

**R1172-4-75LED REFL**



**DRIVER OPTIONS**

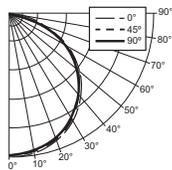
CATALOG #	DESCRIPTION
<b>ED*PH</b>	Philips Xitanium LED driver prewired for non-dimming applications
<b>EDD*PH</b>	Philips Xitanium LED dimming driver prewired for 0-10V controls
<b>EDD*PH*DALI</b>	Philips Xitanium DALI dimming driver
<b>EDSD40*PH</b>	Philips Xitanium 40% step-dimming driver (must specify 120V or 277V)
<b>EDD*PH*MKX</b>	Philips Xitanium Mark X line voltage dimming driver (must specify 120V or 277V)
<b>EDD*LU*HILUME L3D ECO</b>	Lutron Hi-lume® A-Series LED dimming driver for EcoSystem® controls
<b>EDD*LU*HILUME L3D 3WIRE</b>	Lutron Hi-lume® A-Series LED dimming driver for 3-wire controls
<b>EDD*LU*HILUME LTE LINE</b>	Lutron Hi-lume® LED dimming driver for forward phase line voltage controls (120V only)

**PHOTOMETRY**

Catalog #: **75-4-LED\*PH85/840-EDD\*PH**

**TEST REPORT INFORMATION**

- ▶ Test Report #: 17875.0
- ▶ Date: 01/03/14
- ▶ Lamp Type: Philips Fortimo LED light engine
- ▶ **Rated Lumens: 8470**
- ▶ **Watts: 71.6**
- ▶ **Lumens Per Watt: 118.3**
- ▶ **CRI: 83.6**
- ▶ **CCT: 4053K**



**CANDLEPOWER DISTRIBUTION**

Vertical Angle	Horizontal Angle			Zonal Lumens
	0°	45°	90°	
0°	2874	2874	2874	273.8
5°	2895	2865	2854	788.6
15°	2815	2778	2770	1208.3
25°	2643	2604	2590	1480.4
35°	2397	2348	2320	1546.3
45°	2050	1991	1975	1412.3
55°	1622	1568	1548	1067.9
65°	1115	1061	1040	574.1
75°	577	539	527	118.4
85°	103	115	100	
90°	9	14	9	

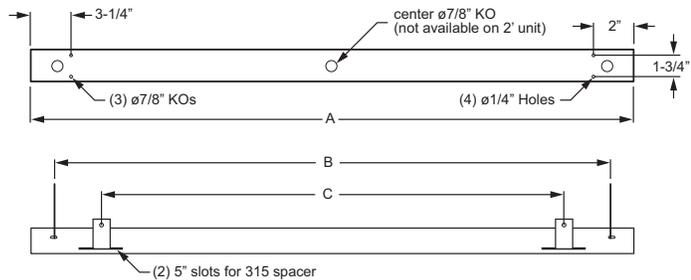
**LUMEN SUMMARY**

Zone	Lumens	% Fixture
0 - 30	2271.	26.8
0 - 40	3751.	44.3
0 - 60	6710.	79.2
0 - 90	8470.	100.0
<b>Total Luminaire:</b>		
0 - 180	8470.	100.0

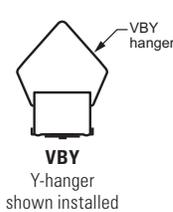
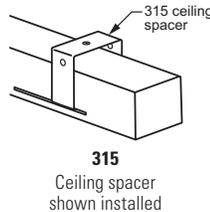
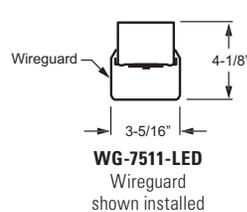
IES Spacing Criteria: End = 1.3  
Across = 1.3

**FIXTURE DETAILS**

	Nominal Fixture Length		
	2'	4'	8'
<b>Actual Length (A)</b>	22-1/4"	44-1/2"	88-3/4"
<b>VBY Hanger (B)</b>	19"	41"	85"
<b>315 Spacer (C)</b>	12"	34"	78"



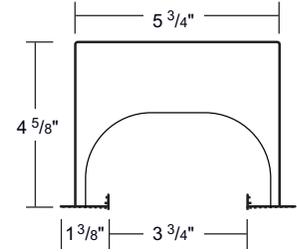
**ACCESSORIES DETAILS**



The U.S. Department of Energy's Lighting Facts® Program has verified product performance based on industry-standardized testing. For details, see H.E. Williams 75 LED at [www.lightingfacts.com](http://www.lightingfacts.com).



# Stream LED Recessed Linear



## ordering - Stream LED

series	LED color 	output	nominal length	trim color	distribution	circuiting	voltage	ceiling system	controls	options
STR	LED3 3000K	LO low output 540 lm/ft	02' N/A T-bar	TMW textured matte white	D1 direct	SC single circuit	UNV 120-277	X1* 1 <sup>5</sup> / <sub>16</sub> T-Bar	ND non-dimming standard	EML* emergency bat- tery (450-630 delivered lm)
	LED35 3500K	SO standard 765 lm/ft	03'	YGW gloss white				X1M† 9 <sup>9</sup> / <sub>16</sub> T-Bar	DM10 0-10v 10% dimming	EMH* emergency bat- tery (900-1080 delivered lm)
	LED4 4000K	HO high 1000 lm/ft	04'	Y_ premium color				X3 hard ceiling	DM01 0-10v 1% dimming	TUN tunable light output (specify desired lm/ft or w/ft)
		R_ row length (1' increments only)	06'	CC custom color				X7 trimless (mud over flange)	STEP step dimming 100-50-off	PRU PRUBIN the next level in LED binning
							*6" Armstrong Techzone™ compatible (TZ6)	DML 1% Lutron dimming		
							†must be hung on 5 <sup>7</sup> / <sub>8</sub> centers	DMD 1% DALI dimming		*remote test switch recommended - consult factory

**Lumen Maintenance:** Designed to last with cool running mid-power LEDs projected to maintain 90% of their initial output for 100,000 hours.

**Per TM21 Calculator**      **Calculated L90 = 100,000 hrs**  
**Per IES TM21 Standards**      **Reported L70 > 36,000 hrs**

**LED System:** Proprietary LED module utilize select LEDs on a robust platform for optimal thermal management. LED modules and drivers are replaceable from below.

**PRUBIN™ (optional):** Prudential Ltg's exclusive 'job binning' method that ensures color temperature consistency across all luminaires on a project. Meticulously testing and labeling EVERY LED board to +/- 25 lumens, +/- 50k CCT and +/- .004 Duv — while also separating positive from negative — allows us to match color, hue and intensity throughout a project and provides a consistent color temperature within a 2-step MacAdam ellipse.

**Electrical:** Must specify LED dimming controls. LED fixtures have constant current driver(s) with less than 20% THD when loaded to a minimum of 60%. Drivers sink a maximum of 6mA per driver. DM10 LED drivers are 0-10V dimmable and are compatible with most 0-10V

wall slide dimmers and direct 0-10V analog signal dimmers. Max driver size 1.25" w x 1" h.

**Construction: Housing;** Die-formed 20-gauge USA steel. **End Caps;** Powder coated steel cap with magnetic attachment. **Trim;** Powder coated extruded aluminum. **Reflector;** 98% high diffuse reflector film (200' roll) UV Stable (UL 94v).

**Labels:** ETL damp labeled and I.B.E.W. manufactured.

**Mounting:** Recessed into ceilings or walls, exposed T-bar or hard ceilings weight 3.75 lbs/ft.

**Warranty:** Single-source, 5 year limited warranty covers standard components and construction.

Prudential reserves the right to change design specifications or materials without notice.

# Recessed Linear **Stream LED**

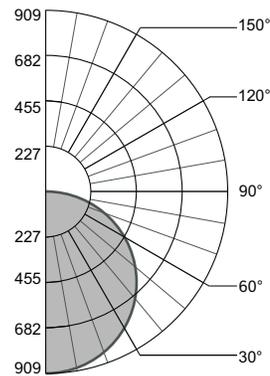
## photometric data

### STR-LED35SO-04-D1

Report # L061407501 D=100% I=0.0%  
Spacing Criteria: Along 1.3; Across 1.3

Delivered Lumens: 3064  
Input Watts: 33.7  
Lumens/Watt: 91

Calculated L90 ≥ 100,000 hours  
Reported L70 (6k) ≥ 36,000 hours  
5 year LED warranty - see prulite.com

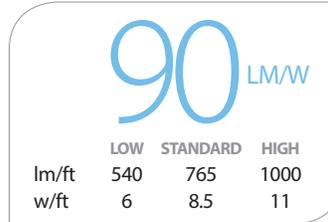


### Zonal Lumen Summary

Zone%	Lumens	% Luminaire
0-90	3064	100.00
90-180	0.00	0.00

### Candlepower Summary

Vertical Angle	Horizontal Angle					Output Flux
	0°	22.5°	45°	67.5°	90°	
0	2619	2619	2619	2619	2619	
5	2290	2337	2462	2578	2603	112
10	1751	1801	1996	2370	2556	
15	1486	1526	1675	2096	2463	254
20	1278	1306	1438	1823	2327	
25	1101	1134	1233	1588	2149	320
30	926	967	1072	1349	1942	
35	787	814	898	1145	1692	320
40	670	689	755	962	1416	
45	559	580	623	792	1141	275
50	460	486	521	645	887	
55	381	394	432	521	673	210
60	315	322	346	407	492	
65	255	260	272	311	346	142
70	203	203	211	228	231	
75	157	153	151	147	146	80
80	103	102	96	89	80	
85	54	50	47	41	32	25
90	0	0	0	0	0	



Lumen output and wattages are nominal for all 3 color changes and may vary +/- 5%.  
4000K +2% from 3500K  
3000K -2% from 3500K

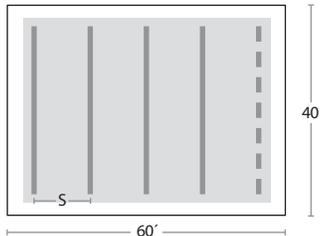
### Coefficients of Utilization (%)

Floor Ceiling Wall	effective floor cavity reflectance = .20											
	80	70	50	30	10	70	50	30	10			
0	119	119	119	119	116	116	116	116	111	111	111	111
1	108	103	98	94	105	101	96	93	96	93	90	90
2	98	89	82	76	95	87	80	75	83	78	73	73
3	89	77	69	62	86	76	68	61	73	66	60	60
4	81	68	59	52	78	67	58	52	64	57	51	51
5	74	61	51	44	72	60	51	44	57	50	44	44
6	68	54	45	39	66	54	45	38	52	44	38	38
7	63	49	40	34	61	48	40	34	47	39	34	34
8	59	45	36	30	57	44	36	30	43	35	30	30
9	55	41	33	27	53	40	32	27	39	32	27	27
10	51	38	30	24	50	37	30	24	36	29	24	24

## Stream's wider spacing

Wide distribution (1.3 sc) means fewer luminaires per job – exceeding industry standards and saving energy.

Recessed Rows:



	watts/ft	spacing (S)	ceiling height	row length	# of 32' rows	average illuminance (30' working plane)	power density (w/ft)	Max	Max	Max/Min Ratio
Low Output - 540 lm/ft	6	12'	9'	32	5	30fc	.4	43	18	2.4
Standard Output - 765 lm/ft	8.5	14'	10'	32	4	36fc	.45	57	23	2.5

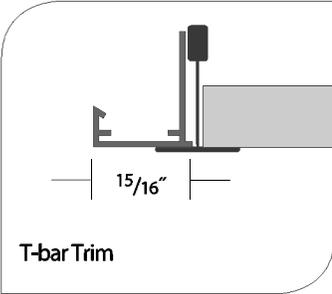
Calculation notes:

- 3500K
- .8 LLF (light loss factor) includes:
  - .86 LLD (lamp lumen depreciation)
  - .95 LDD (luminaire dirt depreciation)
  - .98 RSDD (room surface dirt dep)
- Grey area indicates calculation zone

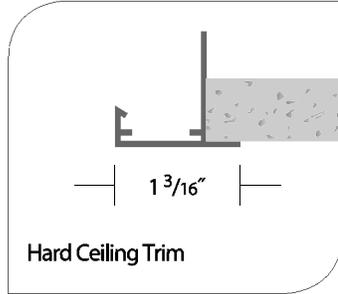
Prudential reserves the right to change design specifications or materials without notice.

# Stream LED Recessed Linear

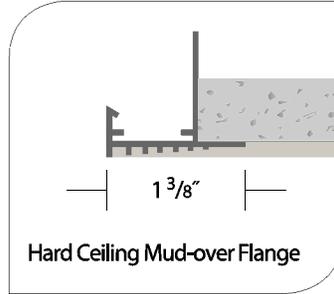
## Mounting Options



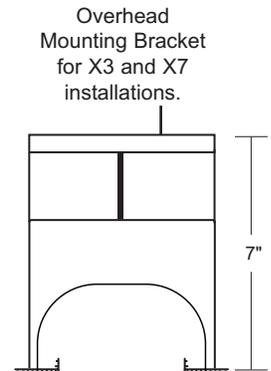
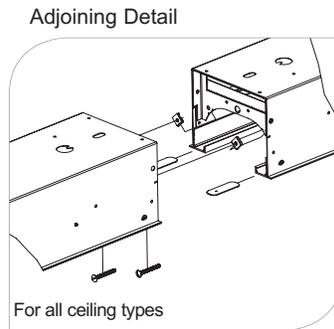
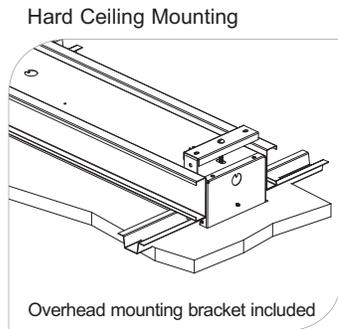
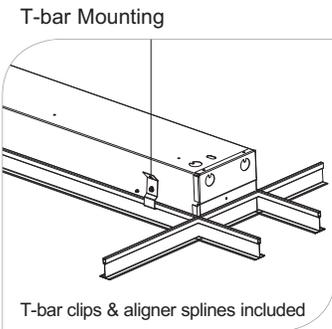
T-bar Trim



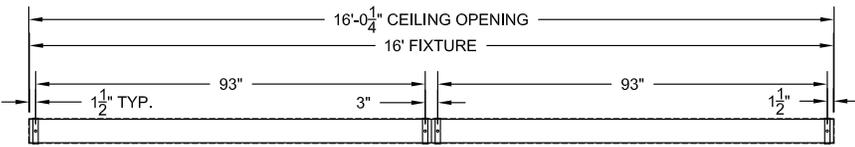
Hard Ceiling Trim



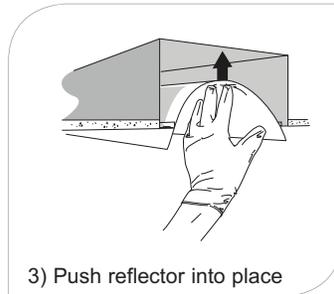
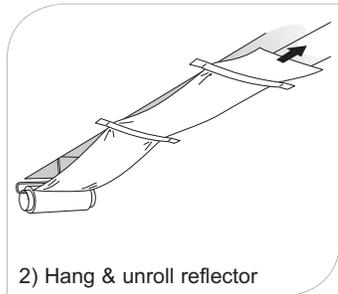
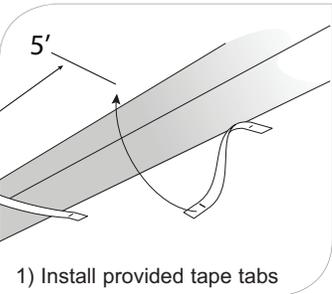
Hard Ceiling Mud-over Flange



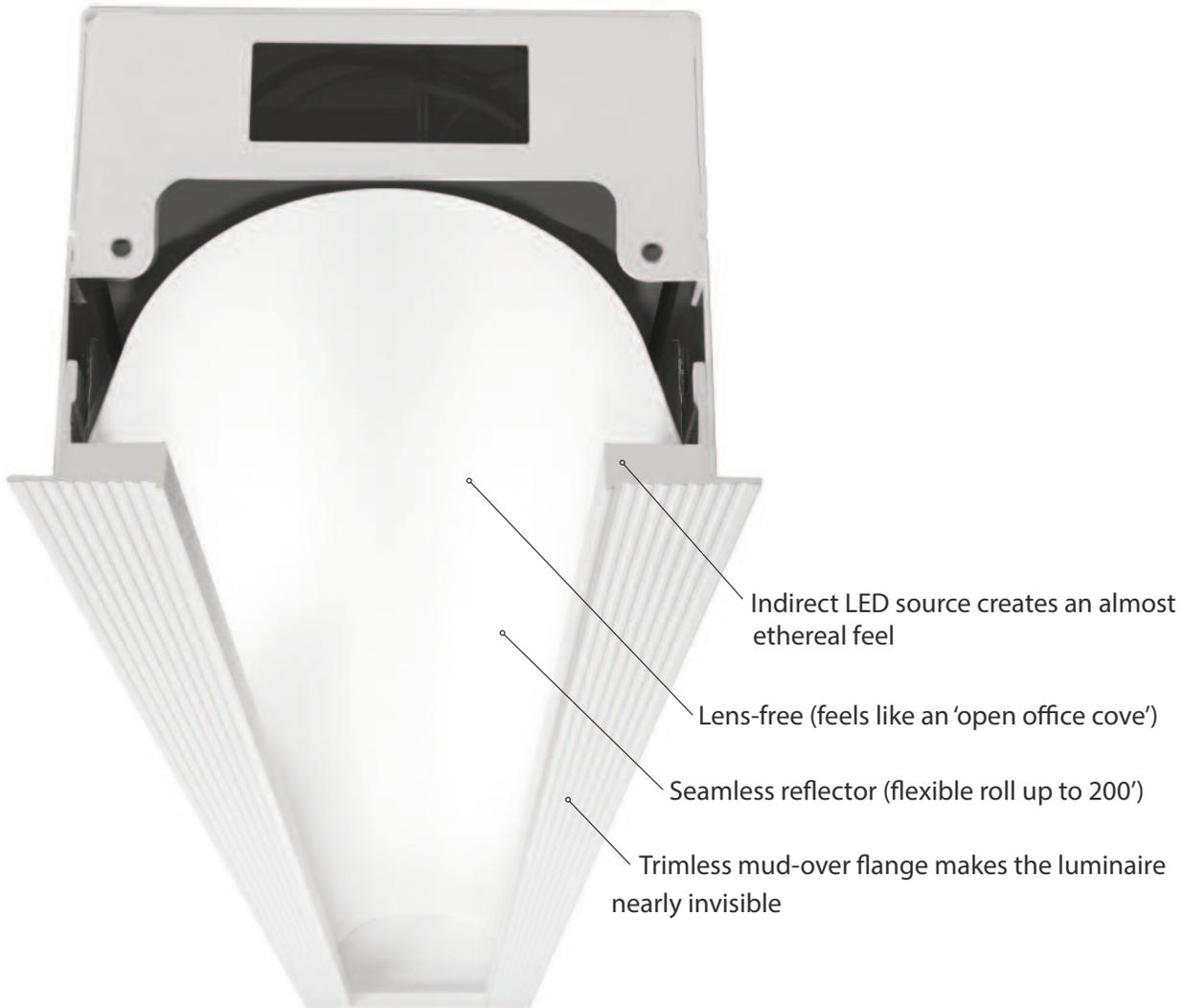
## Mounting locations



## Long runs of the flexible reflector installs in 3 easy steps



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SOLID STATE LIGHTING  
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TASK LIGHTING

**PILOT®**  
WHITE LIGHT & RGB COLOR CHANGING



HINGE MOUNT WITH  
FLAT LENS



SURFACE MOUNT  
INTEGRAL POWER SUPPLY  
WITH FLAT LENS



AIRCRAFT CABLE MOUNT  
WITH WHITE DOME LENS



PENDANT MOUNT  
WITH FLAT LENS

SPECIFICATION

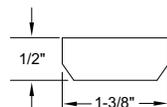
OUTPUT	BEAM ANGLE	7°, 15°, 30°, 45°, 120°, ASY (asymmetric)			
	COLOR TEMPERATURES	2700 K, 3500 K, 4000 K and RGB (4.2 billion colors)			
	LUMENS & EFFICACY (LM/W)	<b>4' - WHITE LIGHT (4000K)</b>			
		WATTAGE	OPTICS	LUMENS	EFFICACY
		3.5 W/FT	7°	1079	66 lm/W
		3.5 W/FT	15°	971	60 lm/W
		3.5 W/FT	30°	987	61 lm/W
		3.5 W/FT	45°	925	57 lm/W
		3.5 W/FT	120°	1106	79 lm/W
		6 W/FT	7°	1650	56 lm/W
	6 W/FT	15°	1489	50 lm/W	
	6 W/FT	30°	1515	51 lm/W	
	6 W/FT	45°	1419	48 lm/W	
	6 W/FT	120°	1496	51 lm/W	
	12W/FT	7°	3272	54 lm/W	
	12W/FT	15°	2954	52 lm/W	
	12W/FT	30°	3004	53 lm/W	
	12W/FT	45°	2814	50 lm/W	
	12W/FT	120°	2991	53 lm/W	
	LUMEN MAINTENANCE	White & RGB: 75,000 hrs L70			
ELECTRICAL	INPUT VOLTAGE	Remote or Integral Power Supplies - 120V to 277V			
	TOTAL POWER CONSUMPTION	<b>FIXTURE WATTAGE</b>	<b>TOTAL POWER CONSUMPTION</b>		
		3.5 W/ft	4.1 W/ft		
	6 W/ft	7.4 W/ft			
	12 W/ft	14.2 W/ft			
CONTROL		DMX Ready			
PHYSICAL	DIMENSIONS (HEIGHT X WIDTH)	Flat Lens: 1/2" X 1-3/8" Dome Lens: 1-1/8" X 1-3/8"			
	HOUSING	Aluminum extrusion with cast aluminum end caps, powder-coated finish			
	LENS	<ul style="list-style-type: none"> <li>• Flat clear acrylic lens is standard with 120° optics</li> <li>• Translucent optical dome lens is standard with 7°, 15°, 30°, 45°, ASY optics</li> <li>• Optional flat white lens (WL) or white dome lens (DV) for direct view applications are available. See "Option &amp; Accessories" on the Ordering Information page (page 2)</li> </ul>			
	OPERATING TEMPERATURES	-25° C to 40° C			
CERTIFICATION	CERTIFICATION	ETL Listed for Dry Location			
WARRANTY	5 YEAR	Limited			

All PILOT® products are tested to IES LM-79 standards

LENSES

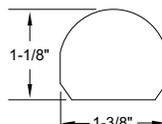
• **Flat Clear Lens:** Standard with 120° optics

• **Flat White Lens:** Option with 120° optics  
(See WL under "Options & Accessories")



• **Translucent Optical Dome Lens:** Standard with 7°, 15°, 30°, 45°, ASY optics

• **White Dome Lens:** Option with 120° optics  
(See DV under "Options & Accessories")



INSIGHT



Rio Rancho, NM 87144  
Tel: 505-345-0888  
www.insightlighting.com



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TASK LIGHTING

**PILOT**<sup>®</sup>  
WHITE LIGHT & RGB COLOR CHANGING

SELECT FIXTURE

PREFIX	WATTAGE WATTS / FT	COLOR TEMP	OPTICS	MOUNTING	FIXTURE LENGTH	POWER SUPPLY LOCATION	FINISH	OPTIONS & ACCESSORIES				
<b>PL</b>	<b>WHITE LIGHT</b>			SM = Surface Mount Integral power supply 24" minimum fixture length  FM = Fixed Mount <sup>1</sup> Remote power supply  HM = Hinge Mount <sup>1</sup> Remote power supply  ACS = Aircraft Cable Remote power supply  PNS-X = Pendant Remote power supply (X = pendant length)  <b>NOTES:</b> <sup>1</sup> DC Jumper cables are required for FM and HM mounting options. See below.	12 = 12"	<b>INTEGRAL POWER SUPPLY WHITE LIGHT OR RGB</b>  INT = Integral Power Supply** 120V - 277V  <b>INTEGRAL DIMMING 0-10V. POWER SUPPLY WHITE LIGHT ONLY</b>  IDIM = Integral Dimming** Power Supply 120V - 277V  ** SM mounting option only ** Not available with 12" fixture ** For feed thru wiring, see ACV option  <b>REMOTE POWER SUPPLY WHITE LIGHT OR RGB</b>  REM = Remote power supply  • CONTRA power supply(s) must be ordered separately. See below.	<b>MW</b> Matte White  <b>MBL</b> Matte Black  <b>BR</b> Semi Gloss Bronze  <b>N</b> Semi Gloss Natural  <b>S</b> Semi Gloss Satin  <b>SF</b> Specify Finish Contact factory  <b>CC</b> Custom Color Contact factory	<b>ACV</b> = Feed thru wiring for integral power supply  • ACV option requires AC jumper cable(s). See below.  <b>MRI</b> = Non-ferrous for non-interference with MRI equipment. Available with FM mounting option only.  <b>RS</b> = Rocker Switch  • RS is a low voltage on/off switch for a single fixture. Switch does not operate the power supply.  • RS is available with FM & HM mountings with White Light only  • RS is available with 120° and flat lens only  <b>WL</b> = Flat White Lens #  <b>DV</b> = White Dome Lens # For direct view applications				
	3.5 = 3.5 W/Ft	27K = 2700K 35K = 3500K 40K = 4000K	7° 15° 30° 45° 120° ASY*		24 = 24"				36 = 36"	48 = 48"		
	6 = 6 W/Ft	27K = 2700K 35K = 3500K 40K = 4000K	7° 15° 30° 45° 120° ASY*		<b>NOTES:</b> <sup>1</sup> DC Jumper cables are required for FM and HM mounting options. See below.							
	* ASY = Asymmetric Distribution											
	<b>RGB COLOR CHANGING</b>											
	6 = 6 W/Ft	RGB = RGB	120°									
	12 = 12 W/Ft	RGB = RGB	120°									
RGB = Fixture Resolution Only												

RGB Notes:

- DMX controls are required. Contact factory.
- One Splitter/LED Programming Kit (CDS-PK) must be ordered for each RGB installation. See below.
- Every fixture is shipped standard as System Control (every fixture has the same address).
- If control per CONTRA output is required, programming to be done in the field (by others) with the DMX Programming Kit (CDS-PK)

**SPECIFY  
VOLTAGE SO WE  
KNOW WHAT  
POWER SUPPLY**

REMOTE CONTRA POWER SUPPLIES FOR WHITE LIGHT (NON-DIMMING)

CATALOG NUMBER	DESCRIPTION	OPTIONS	NOTES
C1/100/PWR/120V	(1)-100W Power Supply, 120V	PL-120 = 120V Plenum Rated Thermal Protector <sup>2</sup>	• Remote power supply distance not to exceed a 25 feet from remote power supply to end of fixture run.  • Remote power supplies are limited to the following fixture run lengths:  <b>3.5WFT:</b> 22' or less of fixtures per power supply <b>6W/FT:</b> 12' or less of fixtures per power supply <b>12W/FT:</b> 6' or less of fixtures per power supply
C1/100/PWR/277V	(1)-100W Power Supply, 277V	PL-277 = 277V Plenum Rated Thermal Protector <sup>2</sup>	
<b>REMOTE CONTRA DIMMING POWER SUPPLIES (0 -10V) FOR WHITE LIGHT</b>			
C1/100/DIM/120V	(1)-100W Dimming Power Supply, 120V	PL-120 = 120V Plenum Rated Thermal Protector <sup>2</sup>	
C1/100/DIM/277V	(1)-100W Dimming Power Supply, 277V	PL-277 = 277V Plenum Rated Thermal Protector <sup>2</sup>	

REMOTE CONTRA POWER SUPPLIES FOR RGB

CATALOG NUMBER	DESCRIPTION	OPTIONS	NOTES: Plenum Rated CONTRA Power Supply
C1/100/RGB/120V	(1)-100W Power Supply, 120V for RGB	PL-120 = 120V Plenum Rated Thermal Protector <sup>2</sup>	<sup>2</sup> All plenum rated cabling to be supplied by others.
C1/100/RGB/277V	(1)-100W Power Supply, 277V for RGB	PL-277 = 277V Plenum Rated Thermal Protector <sup>2</sup>	

ORDERING EXAMPLE: C1 / 100 / RGB / 277V / PL-277

DMX SPLITTERS/PROGRAMMING KIT (FOR INTERIOR USE) - ORDER SEPARATELY

CATALOG NUMBER	DESCRIPTION
CDS-PK	<b>DMX SPLITTER/LED PROGRAMMING KIT</b> One CDS-PK is required per RGB installation. CDS-PK consists of four outputs. Every universe requires its own dedicated CDS-PK. The CDS-PK includes a LED programming kit for field addressing. If additional splitters are required, order CDS1 per project requirements. REMOTE/INT and ACV options differ. For proper CDS-PK product installation, please see CDS DMX Splitter Installation Guide.  The CDS-PK will allow for field changes to the DMX resolution which could result in the consumption of more DMX addresses and could result in the need for more DMX control equipment. Insight is not responsible for determining project resolution requirements, but can be accommodated with a programming kit (CDS-PK).
CDS1	<b>DMX SPLITTER ONLY (4 OUTPUTS)</b> - CDS1 consists of four outputs.

DC JUMPER CABLES - REQUIRED FOR FM & HM MOUNTING OPTIONS

- A DC Jumper is required for each fixture with FM or HM mounting options.
- HM or FM mounting options allow for end-to-end fixture connection. If fixtures are not mounted in an end-to-end continuous manner, additional DC jumpers are required.

AC JUMPER CABLES - REQUIRED FOR ACV OPTION

- An AC Jumper is required for each fixture run for connection from the fixture to the j-box.
- ACV allows for end-to-end fixture connection. If fixtures are not mounted in an end-to-end continuous manner, additional AC jumpers are required.

CATALOG NUMBER	DESCRIPTION	CATALOG NUMBER	DESCRIPTION
DCJ-2	2' DC POWER/DATA JUMPER (NON-PLENUM RATED)	ACJ-2	2' AC POWER/DATA JUMPER (NON-PLENUM RATED)
DCJ-5	5' DC POWER/DATA JUMPER (NON-PLENUM RATED)	ACJ-5	5' AC POWER/DATA JUMPER (NON-PLENUM RATED)
DCJ-10	10' DC POWER/DATA JUMPER (NON-PLENUM RATED)	ACJ-10	10' AC POWER/DATA JUMPER (NON-PLENUM RATED)
contact factory for additional DC Jumper lengths		ACJ-25	25' AC POWER/DATA JUMPER (NON-PLENUM RATED)

INSIGHT

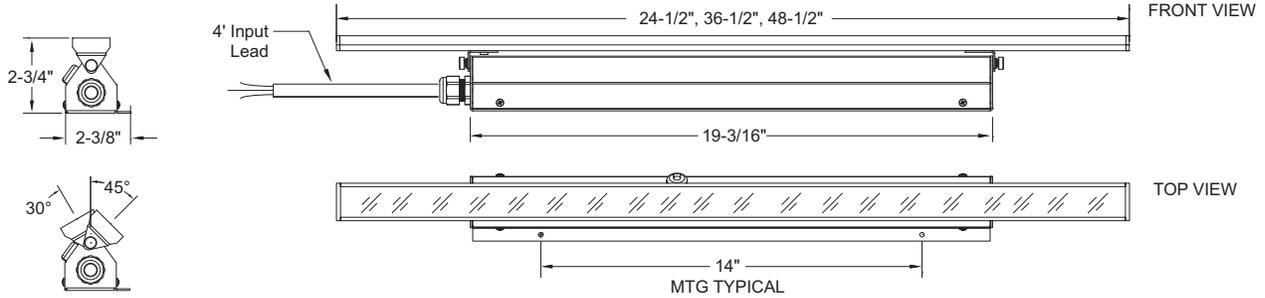


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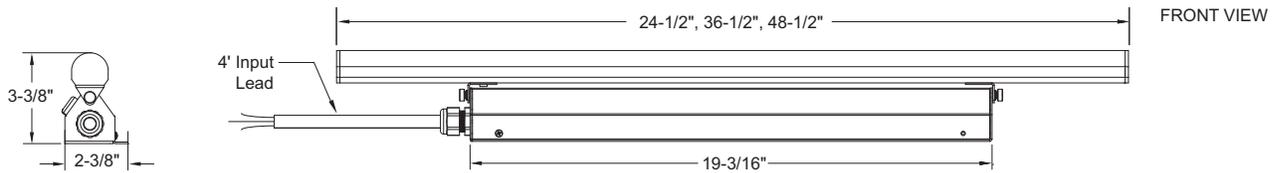
**PILOT<sup>®</sup>**  
WHITE LIGHT & **RGB** COLOR CHANGING

**SM - SURFACE MOUNT - INTEGRAL POWER SUPPLY**

**FLAT CLEAR LENS AND FLAT WHITE LENS \***



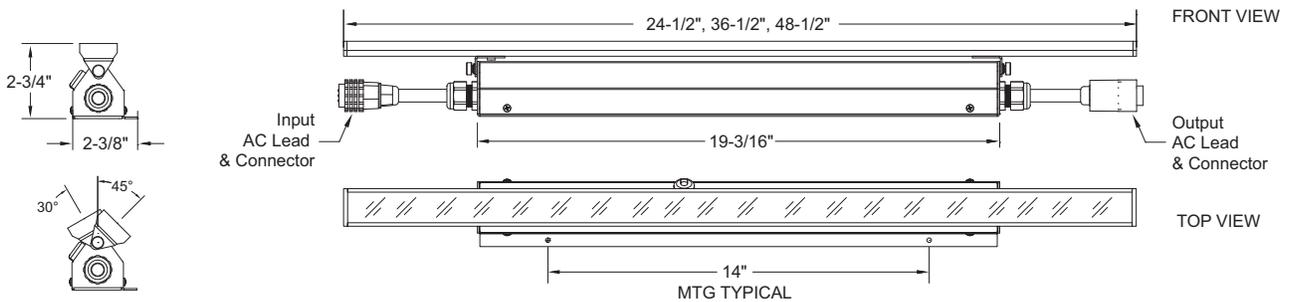
**TRANSLUCENT OPTICAL DOME LENS AND WHITE DOME LENS \*\***



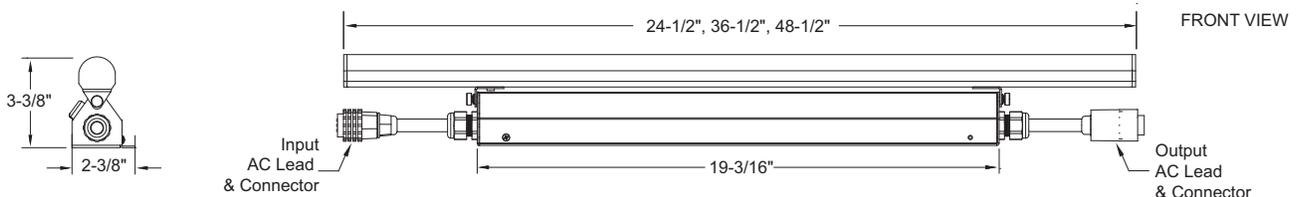
- \* Flat Clear Lens - Standard with 120° optics
- \* Flat White Lens - Option with 120° optics
- \*\* Translucent Optical Dome Lens - Standard with 7°, 15°, 30°, 45°, ASY optics
- \*\* White Dome Lens - Option with 120° optics

**SM - SURFACE MOUNT WITH ACV OPTION - FEED THRU WIRING**

**FLAT CLEAR LENS AND FLAT WHITE LENS \***



**TRANSLUCENT OPTICAL DOME LENS AND WHITE DOME LENS \*\***



**ACV OPTION:**

- An AC Jumper is required for each fixture run.
- ACV Option allows for end-to-end fixture connection. If fixtures are not mounted in an end-to-end continuous manner, additional AC jumpers are required.

- \* Flat Clear Lens - Standard with 120° optics
- \* Flat White Lens - Option with 120° optics
- \*\* Translucent Optical Dome Lens - Standard with 7°, 15°, 30°, 45°, ASY optics
- \*\* White Dome Lens - Option with 120° optics

INSIGHT

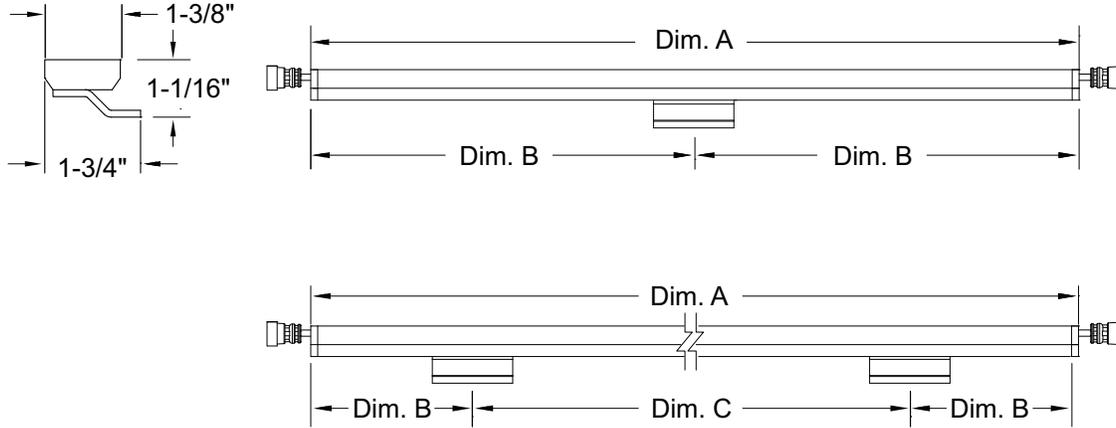


SOLID STATE LIGHTING  
INTERIOR HIGH PERFORMANCE  
LED COVE, LOW PROFILE AND  
TASK LIGHTING

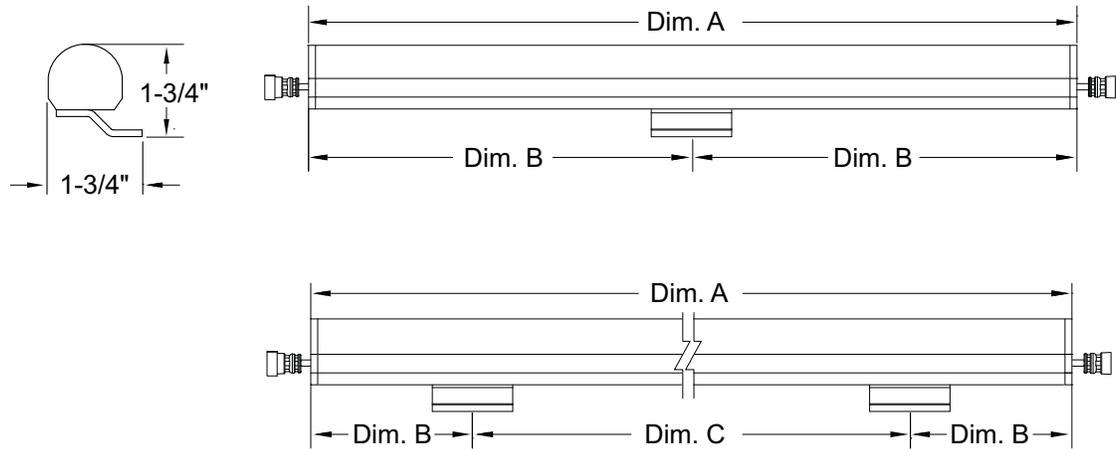
**PILOT<sup>®</sup>**  
WHITE LIGHT & RGB COLOR CHANGING

**FM - FIXED MOUNT - REMOTE POWER SUPPLY**

**FLAT CLEAR LENS AND FLAT WHITE LENS \***



**TRANSLUCENT OPTICAL DOME LENS AND WHITE DOME LENS \*\***



- \* Flat Clear Lens - Standard with 120° optics
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- \*\* White Dome Lens - Option with 120° optics

REMOTE **CONTRA** power supplies and DC jumper cables must be ordered separately. See page 2

Fixture Length	12"	24"	36"	48"
Dim A	12-1/2"	24-1/2"	36-1/2"	48-1/2"
Dim B	6-1/4"	12-1/4"	12-1/4"	12-1/4"
Dim C	n/a	n/a	12"	24"

**INSIGHT**

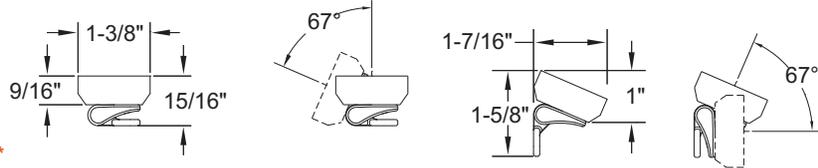
Rio Rancho, NM 87144  
Tel: 505-345-0888  
www.insightlighting.com



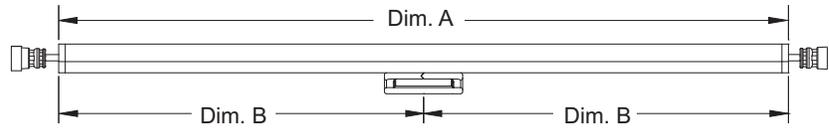
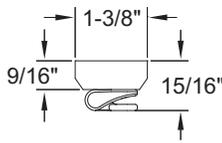
SOLID STATE LIGHTING  
INTERIOR HIGH PERFORMANCE  
LED COVE, LOW PROFILE AND  
TASK LIGHTING

**PILOT®**  
WHITE LIGHT & RGB COLOR CHANGING

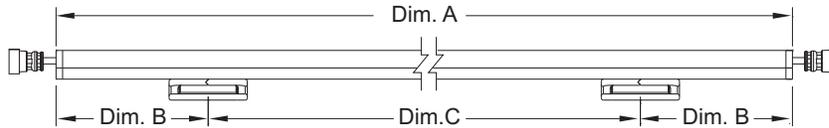
**HM - HINGE MOUNT - REMOTE POWER SUPPLY**



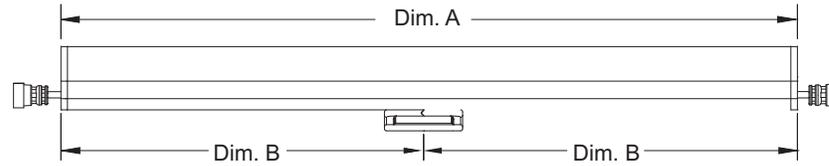
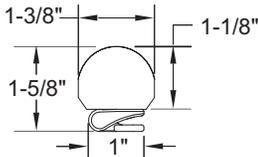
**FLAT CLEAR LENS AND FLAT WHITE LENS \*  
12" & 24" LUMINAIRE**



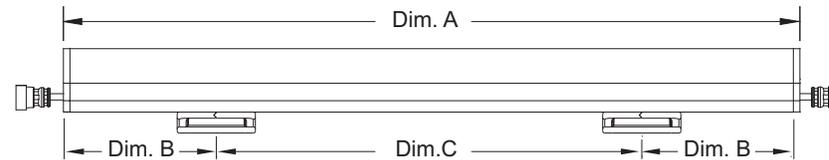
**FLAT CLEAR LENS AND FLAT WHITE LENS \*  
36" & 48" LUMINAIRE**



**TRANSLUCENT OPTICAL DOME LENS AND WHITE DOME LENS \*\*  
12" & 24" LUMINAIRE**



**TRANSLUCENT OPTICAL DOME LENS AND WHITE DOME LENS \*\*  
36" & 48" LUMINAIRE**



REMOTE **CONTRA** power supplies and DC jumper cables must be ordered separately. See page 2

- \* Flat Clear Lens - Standard with 120° optics
- \* Flat White Lens - Option with 120° optics
- \*\* Translucent Optical Dome Lens - Standard with 7°, 15°, 30°, 45°, ASY optics
- \*\* White Dome Lens - Option with 120° optics

Fixture Length	12"	24"	36"	48"
Dim A	12-1/2"	24-1/2"	36-1/2"	48-1/2"
Dim B	6-1/4"	12-1/4"	12-1/4"	12-1/4"
Dim C	n/a	n/a	12"	24"

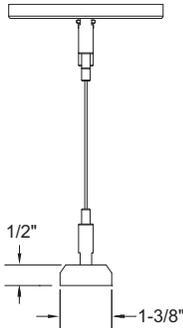


SOLID STATE LIGHTING  
INTERIOR HIGH PERFORMANCE  
LED COVE, LOW PROFILE AND  
TASK LIGHTING

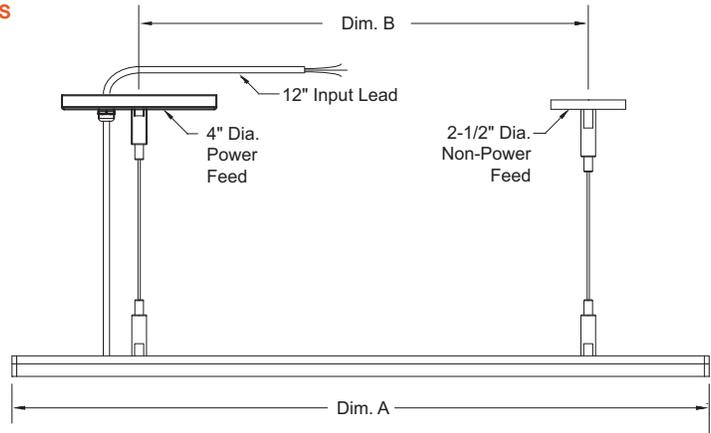
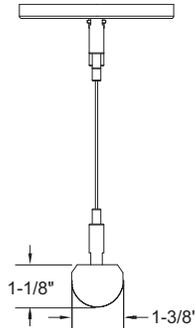
**PILOT®**  
WHITE LIGHT & RGB COLOR CHANGING

**ACS - AIRCRAFT CABLE - REMOTE POWER SUPPLY**

**FLAT CLEAR LENS  
AND  
FLAT WHITE LENS \***



**TRANSLUCENT OPTICAL DOME LENS  
AND  
WHITE DOME LENS \*\***



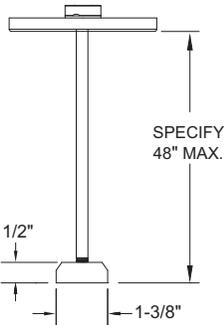
REMOTE **CONTRA** power supplies must be ordered separately. See page 2

- \* Flat Clear Lens - Standard with 120° optics
- \* Flat White Lens - Option with 120° optics
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- \*\* White Dome Lens - Option with 120° optics

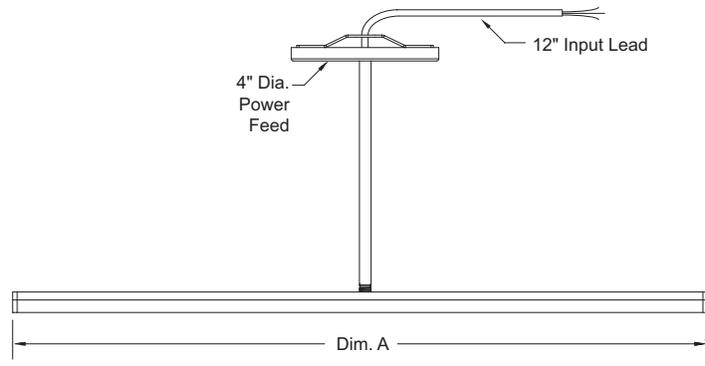
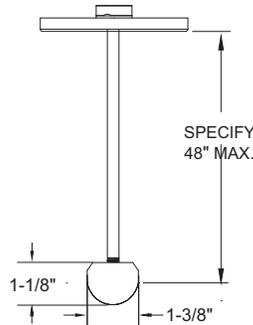
Fixture Length	12"	24"	36"	48"
Dim A	12-1/2"	24-1/2"	36-1/2"	48-1/2"
Dim B	8"	12"	12"	24"

**PNS - PENDANT - REMOTE POWER SUPPLY**

**FLAT CLEAR LENS  
AND  
FLAT WHITE LENS \***



**TRANSLUCENT OPTICAL DOME LENS  
AND  
WHITE DOME LENS \*\***



REMOTE **CONTRA** power supplies must be ordered separately. See page 2

- \* Flat Clear Lens - Standard with 120° optics
- \* Flat White Lens - Option with 120° optics
- \*\* Translucent Optical Dome Lens - Standard with 7°, 15°, 30°, 45°, ASY optics
- \*\* White Dome Lens - Option with 120° optics

Fixture Length	12"	24"	36"	48"
Dim A	12-1/2"	24-1/2"	36-1/2"	48-1/2"



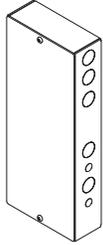
INTERIOR  
DIGITAL POWER  
SUPPLIES

# REMOTE POWER SUPPLIES

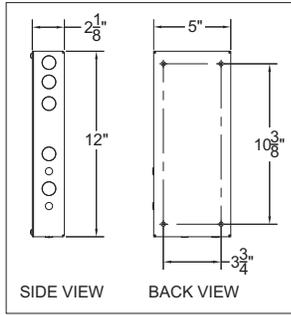
REMOTE POWER SUPPLY POWER, DATA/SPLITTER OPTIONS FOR INTERIOR USE

**CONTRA 1 - FOR INTERIOR USE**

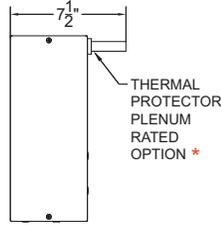
CONDUIT READY  
VERSION SHOWN



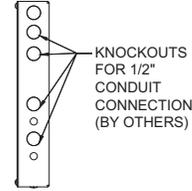
MOUNTING DETAIL



FRONT VIEW



CONDUIT READY  
SIDE VIEW

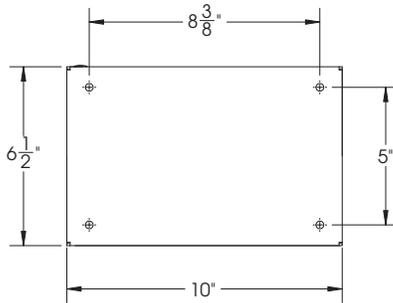
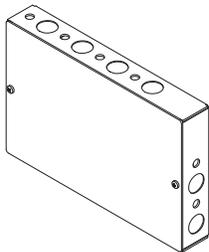


CONDUIT READY  
END VIEW

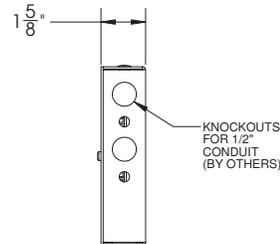


\* All plenum rated cabling to be supplied by others.

**POWER / DATA SPLITTER - CDS-PK - FOR INTERIOR USE**



BACK SIDE VIEW  
WITH MOUNTING DETAILS



SIDE VIEW

Submitting Agency:



**SESCO Lighting**

702 Lindsay Place, Knoxville, TN 37919  
Tel: (865) 633-9288 Fax: (865) 633-9278

Description: **S17-LED-VCF-PF-4-HO-3500k-???**

Project: **OAK RIDGE LIBRARY**

Notes:

Type:

**W4**



BUY AMERICAN ACT OF 2009 COMPLIANT

# FINELITE

## Series 17 LED ADA WM Technical Sheet



**ACF**



**Angled Curved Fascia - Solid (SF)**

**VCF**



**Vertical Curved Fascia - Perforated (PF)**

Date

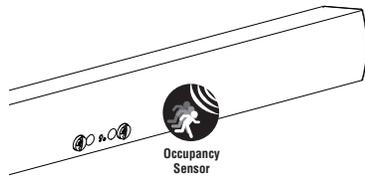
Project

Type

Comments

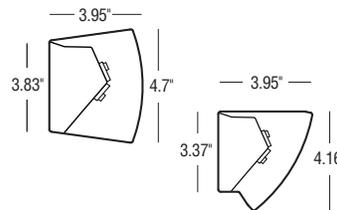
### DESCRIPTION

Light up corridors, stairwells and reception areas without glare and in high style with Series 17 LED ADA Wall Mount luminaires. Choose from Angled Curved Fascia (ACF) or Vertical Curved Fascia (VCF) in solid or perforated design. Series 17 LED uses mid-powered LEDs for long life and evenly distributed illumination. RoHS compliant.



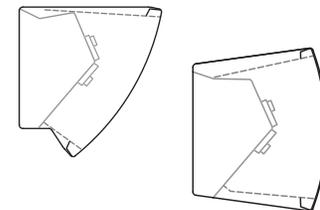
### INTEGRATED SENSORS:

Each unit is available with an optional integrated ultrasonic occupancy sensor.



### DIMENSIONS AND LIGHT ENGINE:

Extending less than 4" from the wall, Series 17 is ADA compliant and uses mid-powered LEDs yielding long life and even light distribution.



### DIFFUSERS:

Standard with frosted acrylic diffuser at the top and bottom openings.

### ORDERING GUIDE

Sample Number: S17-LED - VCF - PF - 4' - SO - 3500K - SC - 277 - OBO



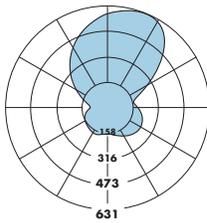
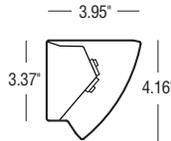


# FINELITE

## Series 17 LED ADA WM Technical Sheet

### PHOTOMETRY

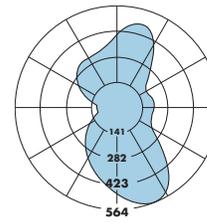
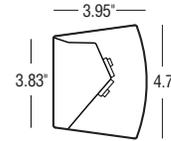
ACF High Output  
Efficacy: 67.3 Lumens per watt  
Total Luminaire Output: 2475 lumens (614 lumens/foot)  
36.8 watts (9.2 watts/foot)  
Peak Candela Value: 631 @ 155  
CRI: 84  
R9: 22  
CCT: 3500K  
ITL LM79 Report 78716



CANDLEPOWER SUMMARY						
	0	45.0	90.0	135.0	180.0	Flux
0	161	161	161	161	161	
5	162	161	161	163	163	15
15	168	161	153	163	169	46
25	187	163	137	155	165	73
35	211	167	115	141	153	95
45	235	170	89	126	146	111
55	251	171	62	112	139	121
65	256	165	39	97	128	122
75	247	152	20	79	111	114
85	226	132	5	63	92	98
90	211	119	0	53	81	
95	196	108	16	58	85	89
105	199	147	77	82	102	122
115	273	237	160	145	146	187
125	395	356	254	221	213	254
135	528	472	351	299	286	294
145	611	553	438	375	358	288
155	631	589	504	442	422	237
165	618	598	548	501	483	155
175	587	584	569	549	539	54
180	570	570	570	570	570	

### PHOTOMETRY

VCF High Output  
Efficacy: 74.7 Lumens per watt  
Total Luminaire Output: 2719 lumens (680 lumens/foot)  
36.4 watts (9.1 watts/foot)  
Peak Candela Value: 561 @ 25°  
CRI: 84  
R9: 22  
CCT: 3500K  
ITL LM79 Report 78717



CANDLEPOWER SUMMARY						
	0	45.0	90.0	135.0	180.0	Flux
0	479	479	479	479	479	
5	502	494	477	459	452	45
15	550	520	457	413	400	132
25	561	518	417	362	349	201
35	498	472	358	307	299	239
45	367	380	286	250	247	235
55	252	265	210	194	196	200
65	206	171	136	141	148	156
75	197	124	72	92	109	118
85	204	113	21	76	112	100
90	206	114	0	73	113	
95	207	116	10	73	113	100
105	198	113	52	123	160	123
115	185	131	111	179	220	155
125	193	186	179	229	271	185
135	245	271	250	266	304	205
145	347	370	314	290	315	203
155	449	440	362	311	315	172
165	477	455	391	339	327	112
175	435	426	404	380	368	38
180	405	405	405	405	405	

### SPECIFICATIONS

**CONSTRUCTION:** Fixture channel is 6063-T6 extruded aluminum. Fascia covers are die-formed 20-gauge steel. Mounting clips are constructed from 22-gauge die-formed steel. All components are hard-tooled to tolerances of +/- 0.010".

**ENDCAPS:** Flat endcap, 14-gauge die-formed steel, adds 0.1" to each end.

**OPTICS:** 96W standard reflector, die-formed painted steel, 96% reflectance white finish. Virgin acrylic UV stabilized lensed diffuser behind perforated fascia is standard.

**DIFFUSERS:** Standard with top 0.080" and bottom 0.060" frosted acrylic diffusers

**LIGHT ENGINE:** Light engine is made up of high performance mid-powered LEDs and is designed to distribute heat properly to maximize the life of the LED. LED color temperature: 3000K, 3500K, 4000K.

**DRIVER:** High performance Constant Current Reduction (CCR) driver standard. Can be wired as dimming or non-dimming. Dimming is compatible with 0-10V controls with a range of 10%-100%. Driver is fully accessible. Power Factor: ≥0.9. Total Harmonic Distortion (THD) <20%. Expected driver lifetime:

100,000 hours. Lutron driver options: Lut3W- 3-wire driver, LutES - EcoSystem driver, Lut2W - 2-wire driver.

\*Driver is wired for dimming or non-dimming. Dimming is compatible with 0-10v controls with a range of 100-10%. Separate dimming for uplight and downlight.

**LUMEN MAINTENANCE:** Series 17 LED is rated to deliver 90% lumen maintenance (L90) to 100,000 hours and 70% lumen maintenance (L70) to 168,000 hours.

**ELECTRICAL:** 120V or 277V prewired. In accordance with NEC Code 410.73 (G), this luminaire contains an internal driver disconnect. Emergency to generator/inverter wiring, internal generator transfer switch, nightlight wiring. Please note: Battery backup not available.

**INTEGRATED SENSORS:** Series 17 LED can be specified with integrated ultrasonic occupancy sensors.

**MOUNTING:** Standard with mounting clips to the wall and not visible from normal viewing angles once installed. One mounting clip is provided for every 16 inches of luminaire for a secure connection to the wall.

Luminaire is snapped into place on the mounting clips and secured using locking screws.

**FEED:** 18 gauge wire standard. 14 gauge wire is used when current exceeds 6 amps. Optional feed uses cord.

**FINISHES:** Finelite Signal White is standard. Optional adders: 185 finishes available from Tiger Drylac's RAL color chart.

**LENGTHS:** Modular section lengths of 2', 3', 4' and 8' section lengths can be combined to make longer runs. Contact factory for additional lengths.

**LABELS:** Fixture and electrical components are ETL listed conforming to UL 1598 in the U.S.A., and Canada; ETL listed to certified CAN/CSA C22.2 No. 250.0. Fixtures will bear ETL labels.

**WEIGHT:** Fixture weight = 2 lb/ft.

**WARRANTY:** Series 17 LED comes standard with a 10-year warranty on all standard components. Optional accessories such as emergency battery packs are covered by their individual manufacturer warranties.



Type

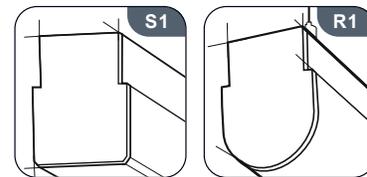
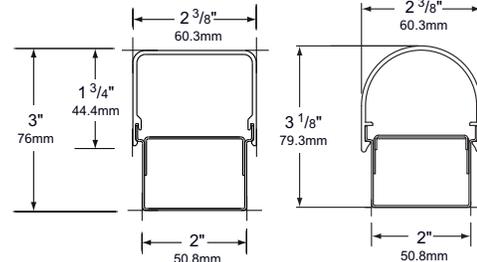
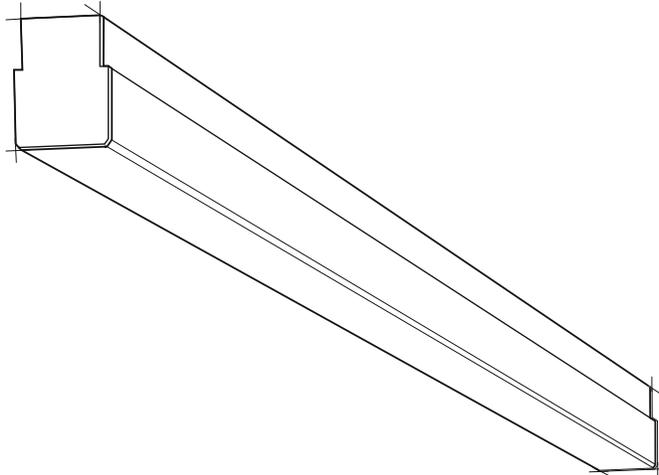
Job Name

Catalog Number



Made in USA

# Snap LED Strips & Industrials



## ordering - Snap LED

series	lamp rows	LED	nominal length	shielding	color/finish	voltage	mounting	ceiling system*	controls/options
S1 square	LED3 LO, SO, HO* 3000K		01** 02'	WA white acrylic	YGW* gloss white	UNV* *120-277	SUR* surface or wall mount	X1 exposed T-bar	ND non-dimming standard DM10 0-10v 10% dimming
R1 round	LED35 LO, SO, HO* 3500K		03' 04'	SAL satin acrylic lens	TMW textured matte white		CA48" aircraft cable (adjustable)	X3 hard ceiling	DM01 0-10v 1% dimming STEP step dimming 100-50-off
	LED4 LO, SO, HO* 4000K		06' 08' R_*		YPE pewter Y_ premium color		CA96" aircraft cable (adjustable)	X6 slot grid *specify with cable mount only	STEP step dimming 100-50-off DML 1% Lutron dimming DMD 1% DALI dimming
	*LO-Low Output, SO-Standard Output, HO-High Output		*row length **LED only		CC custom color GLV** galvanized		*standard		EMH* emergency battery (remote only LED 1000 lumens) TRS tamper resistant screws OCO** S-Occ™ Integrated Occupancy System EBCP1G electrical box cover plate/mud ring, single gang EBCP2G electrical box cover plate/mud ring, dual gang

**Features** Low-profile wrap strip light with extruded acrylic lens that holds securely with no hardware or fasteners. Dimming, emergency, and integrated occupancy sensor options are available – see S-Occ™ information for restrictions and planning information. Can be mounted in clothes closets.

**Construction** Housing construction is die-formed 22-gauge steel with spring-fastened aluminum endplates. Six and eight foot fixtures come with 1 continuous lens - maximum lens length is 8'.

**Finish** The standard exterior body color is polyester powder paint in gloss white. See ordering matrix for optional finishes. End plates are painted black (YBB) with optional galvanized (GLV) finish unless otherwise specified.

**Electrical** Must specify LED dimming controls. LED fixtures have constant current driver(s) with less than 20% THD when loaded to a minimum of 60%. Drivers sink a maximum of 6mA per driver. DM10 and

DM01 LED drivers are 0-10V dimmable and are compatible with most 0-10V wall slide dimmers and direct 0-10V analog signal dimmers. Recommended wall dimmer is Leviton IP710 or equivalent. See data sheet to confirm all specified dimmers meet require specifications. Fixtures are ETL Damp labeled and I.B.E.W. manufactured. Maximum driver size is 1.625" width by 1.25" height.

**Mounting** Fixture is wall- or surface-mounted, or suspended with cables.

Prudential reserves the right to change design specifications or materials without notice.

Submitting Agency:



**SESCO Lighting**

702 Lindsay Place, Knoxville, TN 37919  
Tel: (865) 633-9288 Fax: (865) 633-9278

Description: **R1-LED35 HO-20'-SAL-YGW-UNV-SUR-X3-ND**

Project: **OAK RIDGE LIBRARY**

Notes:

Type:

**SS**



Strips & Industrials **Snap LED**

**photometric data**

R1-LED4LO-04-SAL-YGW-UNV

Report #Lo4142301 D=86.90% I=13.10%  
Spacing Criteria: Along 1.38 ; Across 1.20

Delivered Lumens: 2227

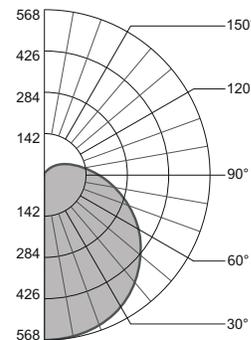
Input Watts: 19.14

Lumens/Watt: 116

Calculated L70 ≥ 100,000 hours

Reported L70 (6k) ≥ 36,000 hours

5 year LED warranty - see prulite.com



**Zonal Lumen Summary**

Zone	Lumens	% Luminaire
0-90	1934.64	86.90
90-180	292.30	13.10

**Candlepower Summary**

Vertical Angle	Horizontal Angle					Output Lumens
	0°	25°	45°	65°	90°	
0	568	568	568	568	568	568
5	568	567	567	566	565	565
15	558	555	549	542	538	538
25	537	528	513	496	485	485
35	503	489	461	431	412	412
45	457	437	399	356	328	328
55	401	378	331	278	240	240
65	338	314	264	202	155	155
75	273	251	203	138	78	78
85	210	192	149	87	20	20
90	181	165	127	52	1	1
95	156	142	107	40	0	0
105	115	104	77	35	0	0
115	85	89	54	23	0	0
125	63	55	38	15	0	0
135	53	38	25	11	0	0
145	29	25	16	9	0	0
155	19	15	11	8	0	0
165	12	9	9	7	0	0
175	7	7	7	7	0	0
180	0	0	0	0	0	0

**Coefficients of Utilization (%)**

Floor Ceiling Wall	effective floor cavity reflectance =										
	80			70			50				
	70	50	30	10	70	50	30	10	50	30	10
0	116	116	116	116	112	112	112	112	104	104	104
1	103	97	92	88	99	94	89	85	87	83	80
2	93	84	76	70	89	81	74	68	75	69	64
3	84	73	64	57	81	70	62	56	65	59	53
4	77	64	55	48	74	62	53	47	58	50	45
5	71	57	48	41	67	55	46	40	51	44	38
6	65	51	42	35	62	50	41	35	46	39	33
7	60	46	37	31	58	45	36	30	42	35	29
8	56	42	33	27	54	41	33	27	38	31	26
9	52	39	30	25	50	37	30	24	35	28	23
10	49	35	27	22	47	34	27	22	33	26	21



**PruBin™** is Prudential Lighting's exclusive 'job binning' method that ensures color temperature consistency across all luminaires on a project. Meticulously testing and labeling EVERY LED board to +/- 25 lumens, +/- 50k CCT and +/- .004 Duv — while also separating positive from negative — allows us to match color, hue and intensity throughout a project and provides a consistent color temperature within a 2-step MacAdam ellipse.

**LED Delivered Lumens and Watts**

	SNAP	LED LO	LED SO	LED HO
Lumens	550 lm/ft	1050 lm/ft	1225 lm/ft	1225 lm/ft
Watts	5 w/ft	10 w/ft	12 w/ft	12 w/ft

Lumen output and wattages are nominal for all 3 color changes and may vary +/- 5%.

Submitting Agency:



**SESCO Lighting**

702 Lindsay Place, Knoxville, TN 37919  
Tel: (865) 633-9288 Fax: (865) 633-9278

Description: **R1-LED35 HO-20'-SAL-YGW-UNV-SUR-X3-ND**

Project: **OAK RIDGE LIBRARY**

Notes:

Type:

**SS**

## Snap LED Strips & Industrials

Square

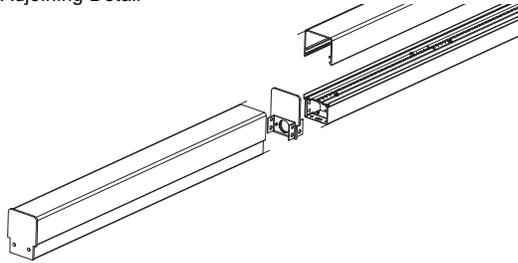


Round

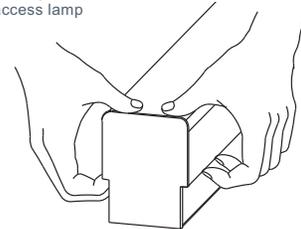


### installation

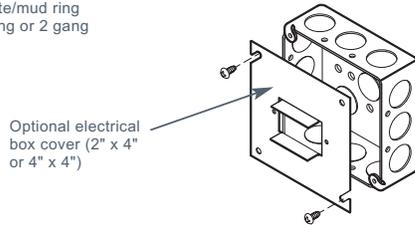
Adjoining Detail



When surface or wall mounting, allow space around fixture to access lamp



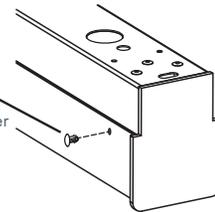
**EBCP:** Electrical box cover plate/mud ring single gang or 2 gang



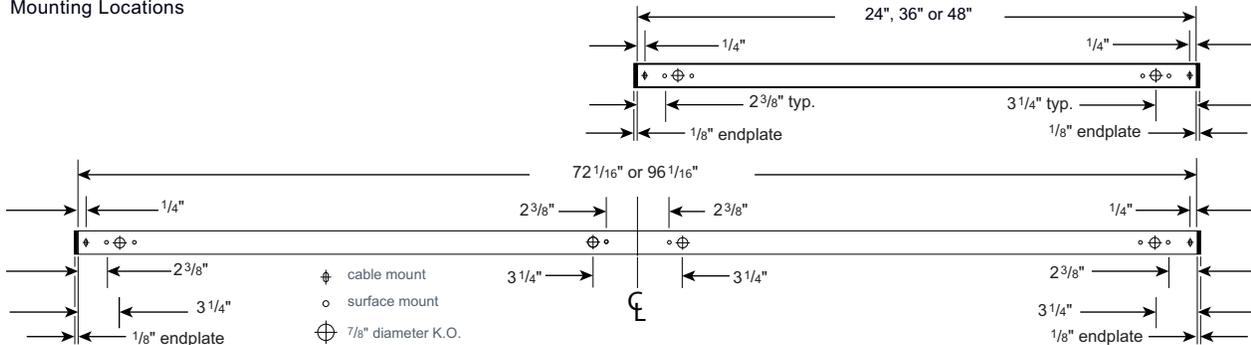
Tamper resistant fastener

TRS

Insert captive retainer with finger pressure.



### Mounting Locations



**FARETTO LARGE**  
LED**SPECIFICATION SHEET**

PAGE: 1 OF 4

Project name: \_\_\_\_\_

Type: \_\_\_\_\_



1690: 23° or 48°



1691: 21°, 27° or 46°

**General information****Luminaire characteristics:****Power input:** 22.5W (1690), 21W (1691)**Lumens:**

3000K: up to 1688 (delivered), 80CRI

4000K: up to 1811 (delivered), 80CRI

**Luminaire efficacy:**

3000K: up to 75lm/W, 80CRI

4000K: up to 80lm/W, 80CRI

**Source:** Bridgelux vero18 (1690) or Lumiled luxeon S (1691).

3000K: 80CRI or 90CRI, 3500K and 4000K: 80CRI.

**Lumen maintenance:** >70% of initial lumens at 50.000 hours (L70)  
LM-80 (LED) / LM-79 tested**Configuration:** 330° vertical (pan), and 270° horizontal (tilt)  
pivoting axes with locking screws.**Optics:****1690:** Aluminum faceted reflector: 23° or 48° beam with clear acrylic protection screen.**1691:** Polycarbonate frosted lens: 21°, 27° or 46° beam with black anodized anti-glare baffle.

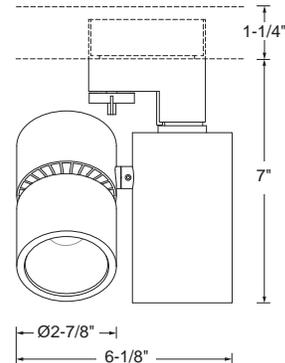
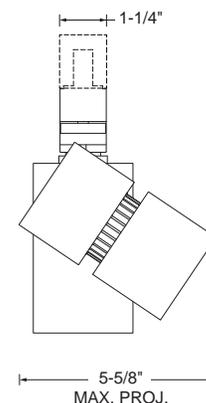
Reflector (1690) or lens (1691) can easily be switched on site without tools.

**Mounting:****Track:** Track adaptor with circuit selector for two circuit tracks. Also, compatible with TEK or HTEK from Nordic Aluminium.**Canopy:** Round die cast aluminum canopy.**Body:** Aluminum housing and heatsink.**Electrical:** Integral high efficiency dimmable driver, 120-277V.**Dimming:** Compatible with Leading (TRIAC) and trailing edge (ELV) for 120V only.**Finish:**

51: Natural matte anodized with black accent and black track adaptor or canopy.

52: Black matte anodized with black accent and black track adaptor or canopy.

01: White painted RAL 9003 with white track adaptor or canopy.

**Weight:** 2.6 lbs. (1.15 Kg) including track adaptor.**Warranty:** 5 years limited warranty.**Certification:** cULus listed.**Ratings:** Damp location.**FRONT VIEW****SIDE VIEW**



**FARETTO LARGE**  
LED

**SPECIFICATION SHEET**

Project name: \_\_\_\_\_

Type: \_\_\_\_\_

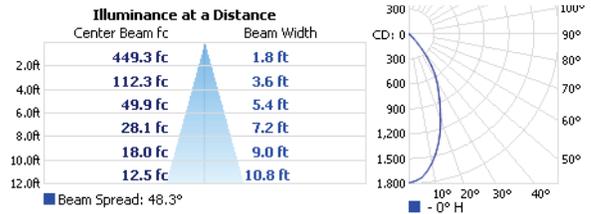
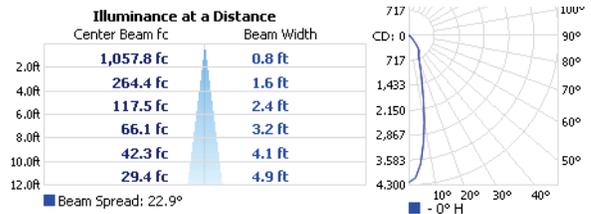
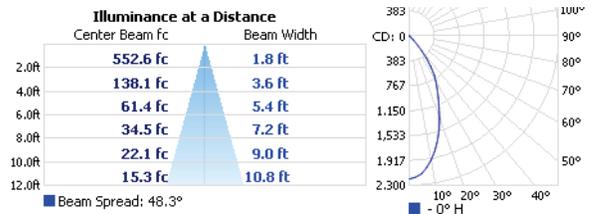
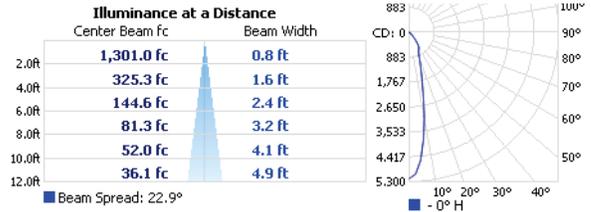
**TECHNICAL DATA 1690**

Model:	<b>830</b>
Color temp.:	3000K
Optic:	Spot beam, 23°
Lumens:	1688lm (delivered)
Luminaire efficacy:	75lm/W

Model:	<b>830</b>
Color temp.:	3000K
Optic:	Flood beam, 48°
Lumens:	1620lm (delivered)
Luminaire efficacy:	72lm/W

Model:	<b>930</b>
Color temp.:	3000K
Optic:	Spot beam, 23°
Lumens:	1372lm (delivered)
Luminaire efficacy:	61lm/W

Model:	<b>930</b>
Color temp.:	3000K
Optic:	Flood beam, 48°
Lumens:	1317lm (delivered)
Luminaire efficacy:	58lm/W





**FARETTO LARGE**  
LED

**SPECIFICATION SHEET**

Project name: \_\_\_\_\_

Type: \_\_\_\_\_

**TECHNICAL DATA 1691**

<b>Model:</b>	<b>830</b>
<b>Color temp.:</b>	3000K, 80CRI
<b>Optic:</b>	Spot beam, 21°
<b>Lumens:</b>	885lm (delivered)
<b>Luminaire efficacy:</b>	42lm/W

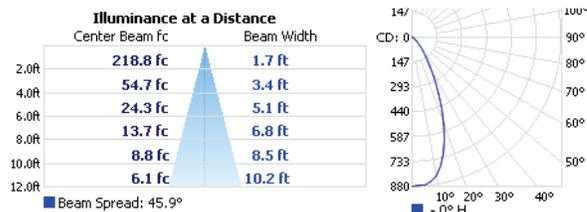
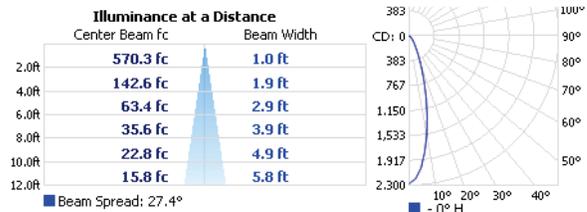
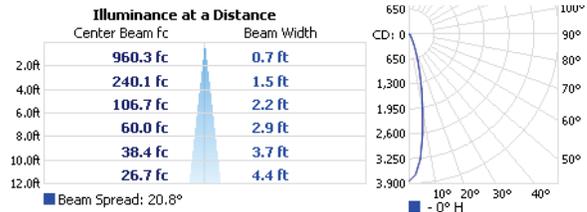
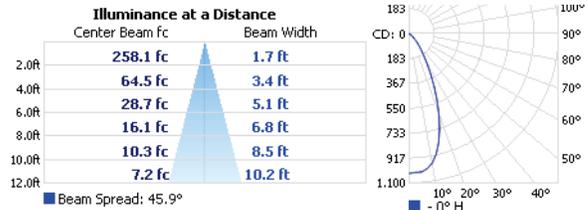
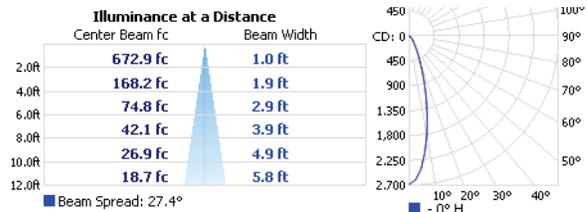
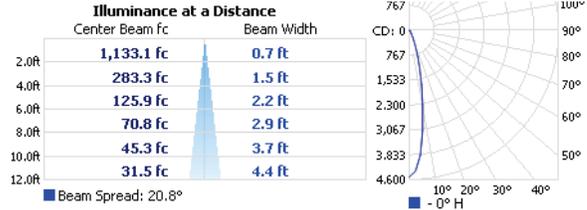
<b>Model:</b>	<b>830</b>
<b>Color temp.:</b>	3000K, 80CRI
<b>Optic:</b>	Medium beam, 27°
<b>Lumens:</b>	852lm (delivered)
<b>Luminaire efficacy:</b>	40lm/W

<b>Model:</b>	<b>830</b>
<b>Color temp.:</b>	3000K, 80CRI
<b>Optic:</b>	Flood beam, 46°
<b>Lumens:</b>	680lm (delivered)
<b>Luminaire efficacy:</b>	32lm/W

<b>Model:</b>	<b>930</b>
<b>Color temp.:</b>	3000K, 90CRI
<b>Optic:</b>	Spot beam, 21°
<b>Lumens:</b>	750lm (delivered)
<b>Luminaire efficacy:</b>	35lm/W

<b>Model:</b>	<b>930</b>
<b>Color temp.:</b>	3000K, 90CRI
<b>Optic:</b>	Medium beam, 27°
<b>Lumens:</b>	722lm (delivered)
<b>Luminaire efficacy:</b>	34lm/W

<b>Model:</b>	<b>930</b>
<b>Color temp.:</b>	3000K, 90CRI
<b>Optic:</b>	Flood beam, 46°
<b>Lumens:</b>	576lm (delivered)
<b>Luminaire efficacy:</b>	27lm/W





**FARETTO LARGE**  
LED

**SPECIFICATION SHEET**

Project name:

Type:

**ACCESSORIES (TO BE ORDERED SEPARATELY)**

\* fixture can hold a maximum of 3 accessories at a time

**1699** - Frosted lens 

**1698** - Elliptic lens 

**1693** - Soft focus lens 

**1696-52** - Black hex cell louver 

**1694-52** - Black cross baffle  
Length: 7/8" (21mm) 

**1697-52** - Black snoot  
Length: 1-5/8" (40mm) 

**1700-52** - Black visor wall washer  
Length: 1-5/8" (40mm) 

**INSTALLATION**

Sistimalux 2 circuit track 120V or 277V  
Canopy for 4" junction box 120-277V (UNV).

**MOUNTING**



**ORDERING INFO**

MODEL	LED	OPTIC	VOLTAGE	FINISH
<input type="radio"/> <b>1690</b> - Track	<input type="radio"/> <b>830</b> - 3000K, 80CRI	<input type="radio"/> <b>20</b> - 23°	<input type="radio"/> <b>120</b> - 120V	<input type="radio"/> <b>01</b> - White
<input type="radio"/> <b>1690C</b> - Canopy	<input type="radio"/> <b>930</b> - 3000K, 90CRI	<input type="radio"/> <b>45</b> - 48°	<input type="radio"/> <b>277</b> - 277V	<input type="radio"/> <b>51</b> - Natural matte anodized
	<input type="radio"/> <b>835</b> - 3500K, 80CRI			<input type="radio"/> <b>52</b> - Black matte anodized
	<input type="radio"/> <b>840</b> - 4000K, 80CRI			

MODEL	LED	OPTIC	VOLTAGE	FINISH
<input type="radio"/> <b>1691</b> - Track	<input type="radio"/> <b>830</b> - 3000K, 80CRI	<input type="radio"/> <b>20</b> - 21°	<input type="radio"/> <b>120</b> - 120V	<input type="radio"/> <b>01</b> - White
<input type="radio"/> <b>1691C</b> - Canopy	<input type="radio"/> <b>930</b> - 3000K, 90CRI	<input type="radio"/> <b>30</b> - 27°	<input type="radio"/> <b>277</b> - 277V	<input type="radio"/> <b>51</b> - Natural matte anodized
	<input type="radio"/> <b>835</b> - 3500K, 80CRI	<input type="radio"/> <b>45</b> - 46°		<input type="radio"/> <b>52</b> - Black matte anodized
	<input type="radio"/> <b>840</b> - 4000K, 80CRI			



# OL2

indoor  
meets BAA requirements  

HOME

Job/Location: \_\_\_\_\_  
Contractor: \_\_\_\_\_  
Prepared By: \_\_\_\_\_

Job Type: \_\_\_\_\_  
Date: \_\_\_\_\_

The **OL2** is a traditionally designed edge lit exit that features a clean, unobtrusive design.

Recessed configurations feature a steel, 20 ga. backbox and trimplate.

Steel trim plate is held in place with two torsion springs. The trim plate is offered in a durable white powder coat finish. Other colors are available.

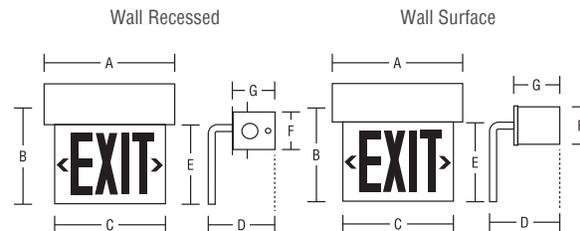
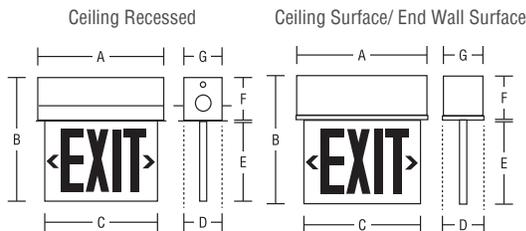
Utilizing indirect LED technology, the **OL2** provides an edge-lit EXIT sign with even light distribution.



**Installation:** The **OL2** can be wall or ceiling; surface or recessed mounted.

Face plates for the **OL2** are constructed of solid acrylic.

Field adjustable chevrons are standard.



Series	A	B	C	D	E	F	G
Ceiling Recessed	14.25"	11.25"	12"	5"	7"	4.25"	4"
	362mm	268mm	305mm	127mm	178mm	108mm	102mm
Ceiling Surface	14.25"	11.25"	12"	5"	7"	4.25"	4"
	362mm	286mm	305mm	127mm	178mm	108mm	102mm
End Wall Surface	14.25"	11.25"	12"	5"	7"	4.25"	4"
	362mm	286mm	305mm	127mm	178mm	108mm	102mm

Series	A	B	C	D	E	F	G
Wall Recessed	14.25"	10.5"	12"	5.25"	8"	4"	4.25"
	362mm	267mm	305mm	133mm	203mm	102mm	108mm
Wall Surface	14.25"	10.5"	12"	5.25"	8"	4"	4.25"
	362mm	267mm	305mm	133mm	203mm	102mm	108mm

### ordering logic

Series	Model	LED	Face No.	Panel Color	Mounting	Options
OL2	HT (AC only)	LR (red)	1 (single)	C <sup>[1]</sup> (clear)	CR (ceiling recess)	AT <sup>[2]</sup> (autotest) PB (polished aluminum brass trim)
	SA (self-powered)	LG (green)	2 (double)	W (white) M (mirror)	WR (wall recess) CS (ceiling surface) WS (wall surface) ES (end surface)	CC (custom color) PK <sup>[3]</sup> (pendant kit- specify length) SW (special wording- specify) BA (brushed aluminum trim) PA (polished aluminum trim)
						2CK (dual-circuit) FAI <sup>[4]</sup> (fire alarm interface) 120SA (120 minute emergency) IF (inverted face)

[1]NOTE: "C (clear)" panel color is only available in "1 (single)" face no.  
[2]NOTE: Autotest option is only available on SA models with battery.

[3]NOTE: Minimum 6" in length.  
[4]NOTE: Specify type- open/closed dry contact.

### builder

Series	Model	LED	Face No.	Panel Color	Mounting	Options

EXAMPLE: OL2-SA-LR1-CCR  
DESCRIPTION: self-powered, red LED, single face, clear panel, ceiling recess



# Technical

## ■ specifications: internal

AC only and Self-Powered models come standard configured with high output, high efficiency LED's. 120/277VAC input. Nickel-cadmium batteries provide a minimum 90 minutes of emergency duration. Optional 120 minute duration battery is available. Solid state charger & transfer.

## ■ specifications: external

The OL2 is constructed from durable 20 gauge steel. The OL2 surface mount housing, recessed backbox and trim plate are all constructed from durable 20 gauge steel. The high clarity acrylic face plate is available in both single face or double face versions, with a clear, white, mirrored background (please specify). Field adjustable chevrons are standard. White, baked powder coat finish is standard on all versions. Available in custom colors (please specify). External LED monitor light and test switch are standard on self-powered versions.

## ■ specifications: electrical

**BATTERY:** The OL2-SA is designed with a maintenance free, Nickel-Cadmium battery providing a minimum emergency duration of 90 minutes. An operational 120 minute Ni-Cad battery is available. Recharge time of the battery is twenty-four (24) hours. The maximum battery working temperature is 45° C. The minimum working temperature is 10°C.

**CIRCUIT:** The OL2 is configured with high output, high efficiency LEDs. Standard with 120/277VAC input. All LED versions consume 2W or less nominal power.

## ■ specifications: mechanical

Universal mounting pattern and key hole slots are stamped into the housing providing various mounting options. Ceiling recessed versions are supplied standard with removable steel T-Bar mounting brackets. Field installable chevrons are standard. Recessed version trim plates are held securely in place with two (2) torsion spring clips that allow the face plate to accommodate uneven or angled ceilings and walls. This design leaves no visible screws, nuts or fasteners in the trim plate that would detract from the clean, traditional design.

## ■ edge-lit design

The OL2 edge-lit exit signs feature a clean and traditional look. The indirect LED illumination evenly lights the acrylic face with crisp, even light. The ultra thin face plate virtually disappears once installed, yet the EXIT lettering boldly distinguishes the path of egress. The wide variety of finishes and mounting configurations available will ensure that the OL2 can be easily matched to your project requirements.



Trim and faceplate mount into backbox for quick and easy installation.

## ■ self-powered versions

The OL2-SA is designed to operate on battery power in the event of a regular / mains power failure. Both the battery and charger are completely contained within the standard enclosure. There are no external components and no alterations made to the external dimensions of the standard sign. The OL2-SA utilizes a solid state transformer that eliminates the possibility of relay failure due to particle build up on the relay. Status is easily determined via an LED that indicates AC-ON. A push button test switch allows maintenance personnel to quickly confirm the operational status of the exit.

## ■ autotest

The OL2 has the option for the Beghelli Autotest diagnostic system. The Beghelli Autotest features continuous monitoring of the units main components (battery, charger, transformer, lamps & LED's) and provides instant visual verification of the status.

## ■ warranty

The OL2 comes with a 5-year factory warranty. Deliberate damage, misuse, improper installation effectively cancel the warranty.



# PACO (PCH)

indoor / damp



HOME

Job/Location: \_\_\_\_\_  
Contractor: \_\_\_\_\_ Job Type: \_\_\_\_\_  
Prepared By: \_\_\_\_\_ Date: \_\_\_\_\_

■ The **PACO PCH** combination exit and emergency unit features performance and reliability in a small and attractive package.

**Lamps:** Two 1.5W LED fully adjustable lamp heads ensure emergency lighting performance, accurate positioning and reduced maintenance.

Available with red or green LED's, the **PACO PCH** features a reduced housing size and soft, rounded edges.



■ **Installation:** The **PACO PCH** combination is designed for surface wall or ceiling installations. Suitable for indoor / damp location environments.

■ **Mounting:** The thermoplastic housing comes in white as standard; optional black is available. The quick connect installation system allows for effortless surface mount installation.

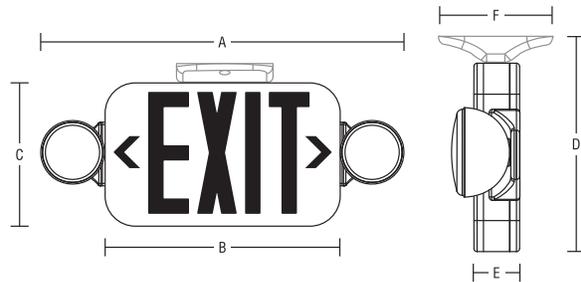
NOTE: 3 year warranty standard, see details on next page.

## ■ specifications: internal

The PACO PCH uses a rechargeable, maintenance free 3.6V 900mAh nickel cadmium battery. Configured with 120/277VAC input. The circuit board features an onboard solid state transformer, low voltage disconnect and brownout protection. Red or green LEDs totaling less than 2W.

## ■ specifications: external

The PACO PCH is constructed from high impact, injection molded thermoplastic. White finish is standard. Each emergency head houses a single LED cluster that totals 1.5W. The exit sign features field adjustable chevrons. The PACO PCH can be universally mounted single or double face (extra faceplate included). Integrated test switch/monitor LED gives immediate unit status. Damp location rated.



Series	A	B	C	D	E	F
PCH	17.9"	11.6"	7.2"	8.2"	1.75"	4.33"
	456mm	295mm	183mm	208mm	44mm	110mm

## ■ ordering logic

Series	LED Color	Model	Options
PCH	R (red)	HT (AC Only)	RC (remote capable)
	G (green)	SA (self powered)	

## ■ builder

Series	LED Color	Model	Options

EXAMPLE: PCH-R-RC  
DESCRIPTION: Red LED, Remote Capable, Damp Location.



# Technical

## ■ emergency heads

Two 1.5W LED fully adjustable lamp heads ensure emergency lighting performance, accurate positioning and reduced maintenance. Each emergency head houses a single LED cluster that totals 1.5W.

## ■ specifications: electrical

**BATTERY:** The PACO PCH is designed with a 3.6V 900mAH maintenance free sealed nickel cadmium battery that provides minimum emergency duration of 90 minutes. The recharge time of the battery is 24 hours.

**CIRCUIT:** The PACO PCH has a 120/277VAC solid state transformer. Low voltage disconnect and brownout protection are standard. Red or green LEDs totaling <2W.

## ■ specifications: mechanical

PACO PCH exit provides performance and reliability in a small and modern design. The low profile, rounded corners and an overall reduced size, make the PACO PCH one of the smaller, code compliant exit signs available.

## ■ self-powered

The PACO PCH self-powered is designed to operate on battery power in the event of regular / mains power failure. Both the battery and charger are completely contained within the standard sign. There are no external components and no alteration made to the external dimensions of the standard sign. Status is easily determined via an LED that indicates AC-ON. A push button test switch allows maintenance personnel to quickly confirm the operational status of the exit at any time.

## ■ warranty

The PACO PCH comes with a 3-year factory warranty. Deliberate damage, misuse, improper installation effectively void the warranty. For complete warranty details see online.



## LMRC-210 Series Digital On/Off/0-10 Volt Dimming Room Controllers

Plenum-rated controllers with line voltage relay(s) and 0-10 volt dimming output(s)

120/277 volt and 347 volt models

Plug to other components using Cat 5e cables with RJ45 connectors eliminating wiring errors



Plug n' Go automatic configuration for maximum energy efficiency

Store load preset level and 16 scene preset levels for each load

Support energy saving manual-on, bi-level, tri-level and dimming control strategies

PROJECT
LOCATION/TYPE

### Product Overview

#### Description

LMRC-210 Series Digital Room Controllers include one, two or three relay(s) to switch a total of 15 or 20 amps, a high-efficiency switching power supply and one 0-10 volt output per relay for control of dimmable loads including electronic ballasts (Advance Mark 7, or equivalent). They are the foundation of a WattStopper Digital Lighting Management (DLM) system, and allow integration of occupancy sensors, daylighting controls and switches for energy-efficient lighting control.

#### Operation

LMRC-210 Series Room Controllers operate on one 120 or 277 volt, 20 amp, or 347 volt, 15 amp, feed and provide Class 2 power to sensors and switches via the DLM local network. Once powered up, Plug n' Go automatically configures system components for the most energy-efficient operation. The room controllers then dim or switch lighting or motor loads in response to input from the communicating devices. When a dimming input is received, the relay switches on when the dimmed level rises above zero, and off when it reaches zero, to coordinate control of power and the 0-10 volt signal to the load. They also monitor the current draw of the total connected load. Each room controller stores up to 16 scene preset levels for each dimmed output.

### Features

- Plug n' Go™ automatic configuration for quick installation and maximum energy savings
- Push n' Learn™ functionality for personalization without the need for tools or a PC
- Digital Lighting Management components plug together on a free-topology Cat 5e DLM local network
- On/Off/Dim local override button for each load
- LED indicates status of each load

### Plug n' Go Automatic Configuration

DLM room controllers manage Plug n' Go automatic system configuration, which establishes functionality based on the installed components. When room controllers are connected only to occupancy sensors, the system defaults to automatic on/off operation. If a wall switch is added to a system with one load, the load defaults to manual-on/automatic-off operation. If there is a wall switch and multiple loads, load one turns on automatically, while additional loads default to manual-on control; all loads turn off automatically. At system startup, default dimming parameters are established including: levels for scene presets 1-4; fade times; and fade and ramp rates. Dimming and system parameters may be customized using Push n' Learn.

### Applications

LMRC-210 Series Room Controllers are ideal for single or multiple zone on/off or dimming lighting control applications. They are appropriate for applications in private offices, open offices, conference rooms and classrooms in any commercial building. LMRC-210 Series Room Controllers also help facility managers who want to track building power usage by monitoring current for lighting or other loads. A network bridge (LMBC-300) is required to expose DLM local network power data readings to a Segment Manager or BAS.

- Integral current monitoring of total connected load
- Optional lamp burn in; 12 or 100 hours
- 4 RJ45 ports with integral strain relief
- Zero-crossing circuitry for each relay for reliability and increased product life
- UL 2043 plenum rated
- RoHS compliant
- Qualifies for ARRA-funded public works projects

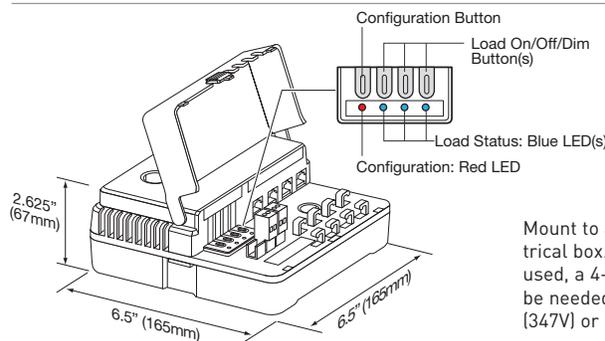


## Specifications

- Voltage: 120/277VAC or 347VAC; 50/60Hz
- Maximum 20A combined load per Room Controller; each relay rated for:
  - @120/277V, 20A ballast or incandescent or 1Hp motor load; @347V, 15A ballast only
- Class 2 dimming control signal: 0-10VDC, sinks up to 100mA per channel for control of compatible ballasts (50 if each sources 2mA)
- Class 2 output to DLM local network: 24VDC, up to 250mA across 4 RJ45 ports
- DLM local network parameters:
  - Maximum current: 800mA
  - Category 5e cable, up to 1,000'
  - Up to 64 loads
  - Up to 48 communicating devices
  - Maximum 4 LMRC-100 Series Room Controllers
- Operating conditions: for indoor use only;
  - @120/277V: 32-158°F (0-70°C), @347V 32-140°F (0-60°C); 5-95% RH, non-condensing
- UL (88T9) and cUL listed
- FCC part 15 compliant
- Five year warranty

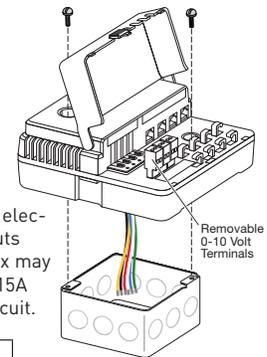
## Controls & Mounting

### Controls and Dimensions



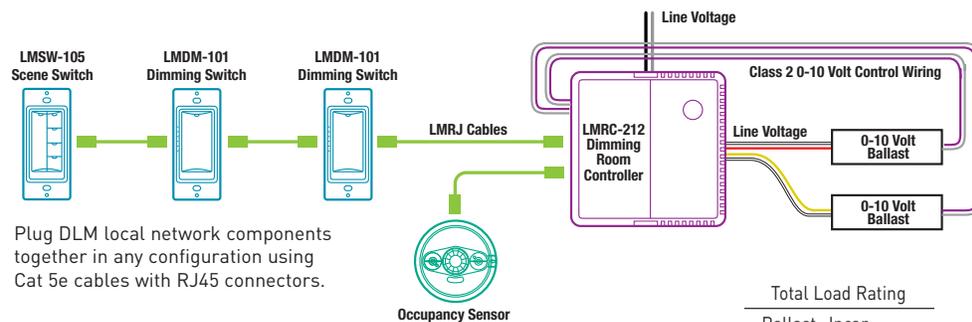
### Mounting and Wiring

Mount to 4" x 4" x 2 1/8" deep electrical box. Depending on outputs used, a 4-square extension box may be needed. Connect to single 15A (347V) or 20A (120 or 277V) circuit.



Load Parameter (for each dimmed output)	Default Setting	Available Options
High trim	100%	1-100%
Low trim	0%	0-99%
Preset level: Scenes 1-16	1: 100%, 2: 75%, 3: 50%, 4: 25%, 5-16: 100%	all: 0-100%
Preset fade time	2 seconds	0 seconds -18 hours
Lamp burn in time	0	0, 12 or 100 hours

## Connecting Sample Connection Diagram with Dimming Switches and Scene Control



Plug DLM local network components together in any configuration using Cat 5e cables with RJ45 connectors.

## Ordering Information

Catalog. No.	Description	Voltage	Total Load Rating			Class 2 Outputs
			Ballast (A)	Incan (A)	Motor	
<input type="checkbox"/> LMRC-211	1 Relay Room Controller, 0-10V dimming	120/277VAC	20	20	1 Hp	24VDC, 250mA and 0-10VDC
<input type="checkbox"/> LMRC-211-U	1 Relay Room Controller, 0-10V dimming, ARRA compliant*					
<input type="checkbox"/> LMRC-211-347	1 Relay Room Controller, 0-10V dimming	347VAC only	15	-	-	
<input type="checkbox"/> LMRC-212	2 Relay Room Controller, 0-10V dimming	120/277VAC	20	20	1 Hp	
<input type="checkbox"/> LMRC-212-U	2 Relay Room Controller, 0-10V dimming, ARRA compliant*					
<input type="checkbox"/> LMRC-212-347	2 Relay Room Controller, 0-10V dimming	347VAC only	15	-	-	
<input type="checkbox"/> LMRC-213	3 Relay Room Controller, 0-10V dimming	120/277VAC	20	20	1 Hp	
<input type="checkbox"/> LMRC-213-U	3 Relay Room Controller, 0-10V dimming, ARRA compliant*					
<input type="checkbox"/> LMRC-213-347	3 Relay Room Controller, 0-10V dimming	347VAC only	15	-	-	
<input type="checkbox"/> LMRC-CA	Conduit Adapter for Low Voltage Connections					

\*Product produced in the U.S.



## LMSW-105 Digital 5-Button Scene Switch

Low voltage switch for control of four preset scenes and raise/lower control of scenes or loads

Component of Digital Lighting Management integrated control system

Plugs to other components using Cat 5e cables with RJ45 connectors eliminating wiring errors



Plug n' Go automatic configuration and Push n' Learn for personalization

Customizable buttons with LED status indicators

Active Dim feature enables temporary adjustment of any selected load

PROJECT

LOCATION/TYPE

### Product Overview

#### Description

The LMSW-105 Digital Scene Switch is a low voltage device that sets and recalls preset lighting scenes and raises and lowers lighting levels. It is part of a Digital Lighting Management (DLM) system and controls loads connected to DLM room controllers by accessing four of the 16 scenes available in a DLM local network.

#### Operation

The LMSW-105 operates on Class 2 power supplied to a DLM local network by one or more room controllers. Plug n' Go automatic configuration assigns presets 1, 2, 3 and 4 to the scene buttons on the switch upon system startup. When multiple switches are installed, default operation is for multi-way control; each switch controls the same scenes. Scene buttons may be reconfigured to control different scenes or control loads instead of scenes. Users activate a scene by tapping one of the scene buttons. They may raise or lower light levels, and turn lights on or off, with the paddle. In Active Dim mode, users can temporarily adjust the level of any dimmable load or scene on the local network by selecting a load or scene button and then pressing and holding the paddle on the LMSW-105.

### Features

- Hidden configuration button for easy access to Push n' Learn mode
- Used with DLM dimming room controller
- Master raise/lower paddle and all-on/all-off control
- Infrared (IR) transceiver for wireless configuration and control
- Sleek single gang device fits decorator wall plates
- May be used for multi-way control applications
- LED status indicators
- Six color options and custom engraving options; standard buttons may be replaced in the field
- RoHS compliant
- Qualifies for ARRA-funded public works projects

### Personalizing Scene Switches

Plug n' Go assigns all loads to each LMSW-105 upon system startup. Load assignments may be changed using Push n' Learn. Preset scene levels are stored by the room controllers, and default levels are established by Plug n' Go. Scene 1 is 100%, scene 2 is 75%, scene 3 is 50% and scene 4 is 25%. Preset levels can be easily changed by adjusting lighting to the desired level, typically using LMDM-101 dimming switches assigned to control each load, or channel, and pressing and holding a scene button on the LMSW-105 to memorize the new levels. Each scene switch may be personalized in the field with custom-engraved buttons. The integral IR transceiver allows both wireless configuration and system operation.

### Applications

The LMSW-105's sleek low profile appearance is ideally suited for use in conference and board rooms, classrooms, training centers, and other applications where preset scene-based dimming control is desired. The LMSW-105 Scene Switch works with LMDM-101 Digital Dimming Wall Switches to create a flexible and elegant small dimming system. Digital Lighting Management's Active Dim feature gives designers the option of reducing wall clutter by facilitating scene setting without the need for individual dimming switches for each load.

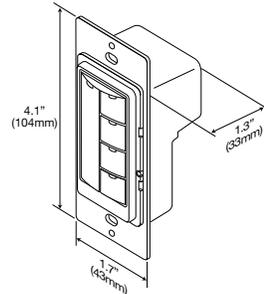
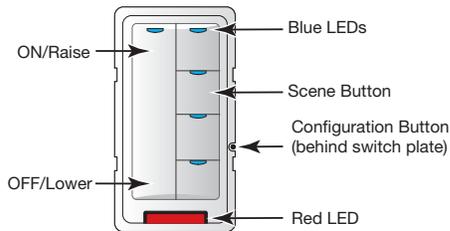


## Specifications

- Input voltage: 24VDC from DLM local network
- Current consumption: 5mA
- DLM local network connection: 2 RJ45 ports
- Control button with LED status indicator
- Hidden configuration button for access to Push n'Learn mode
- Infrared (IR) transceiver
- Operating conditions: for indoor use only; 32-131°F (0-55°C); 5-95% RH, non-condensing
- UL and cUL listed
- FCC part 15 compliant
- Five year warranty

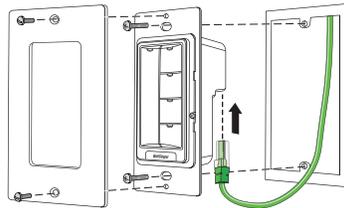
## Controls & Dimensions

### Switch Controls and Dimensions



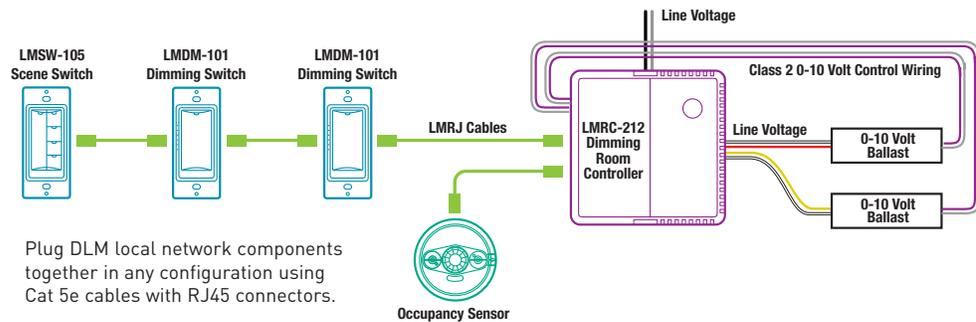
## Mounting & Connecting

### Mounting



LMSW-105 Scene Switches fit in standard single gang boxes.

### Sample Connection Diagram with 0-10 Volt Dimming



Plug DLM local network components together in any configuration using Cat 5e cables with RJ45 connectors.

## Ordering Information

Catalog No.	Color	Description
<input type="checkbox"/> LMSW-105-W	White	Digital 5-Button Scene Switch
<input type="checkbox"/> LMSW-105-W-U	White	Digital 5-Button Scene Switch, ARRA-compliant*
<input type="checkbox"/> LMSW-105-LA	Light Almond	Digital 5-Button Scene Switch
<input type="checkbox"/> LMSW-105-I	Ivory	Digital 5-Button Scene Switch
<input type="checkbox"/> LMSW-105-I-U	Ivory	Digital 5-Button Scene Switch, ARRA-compliant*
<input type="checkbox"/> LMSW-105-G	Grey	Digital 5-Button Scene Switch
<input type="checkbox"/> LMSW-105-B	Black	Digital 5-Button Scene Switch
<input type="checkbox"/> LMSW-105-R	Red	Digital 5-Button Scene Switch

Switches do not include face plates. Order decorator style plate separately.  
\*Product produced in the U.S.



Submitting Agency:



**SESCO Lighting**

702 Lindsay Place, Knoxville, TN 37919  
Tel: (865) 633-9288 Fax: (865) 633-9278

Description:

**LMCT-100**

Project:

**OAK RIDGE LIBRARY**

Notes:

**PRELIMINARY SPECS**

Type:



Configuration Tools | DIGITAL LIGHTING MANAGEMENT

# LMCT-100 Digital Wireless Configuration Tool

Wireless advanced configuration capabilities for Digital Lighting Management systems

2-way IR communication for data upload, download, confirmation and storage

Component of Digital Lighting Management integrated control systems

Easy-to-use navigation pad

Easy-to-read OLED screen



Configures occupancy sensors, switches, room controllers, photo-sensors and DLM relay panels

PROJECT
LOCATION/TYPE

## Product Overview

### Description

The LMCT-100 Wireless Digital Configuration Tool is a handheld tool for advanced remote configuration of any WattStopper Digital Lighting Management (DLM) system. The tool enables system and device modifications via pushbutton, without ladders or tools, as well as easy duplication of settings between DLM local networks.

### Operation

Powered by three AAA batteries, the LMCT-100 features an easy-to-read organic LED (OLED) screen and bi-directional communication with IR-enabled DLM devices. Its intuitive navigation pad provides a familiar interface for users who can see the current system parameters of a DLM local network and make changes by navigating through simple menus. Adjustable occupancy sensor parameters include sensitivity, time delay and trigger modes. Load parameter settings (also referred to as Push n' Learn) include blink warning, Auto- or Manual-on mode, and re-assigning specific loads to different sensors. Button configuration options include type (load or scene), mode, fade times and scene lock. Dimming parameters include low/high trim, preset level and lamp burn in time. Daylighting adjustments include operating mode, setpoints, fade times and time delays. The LMCT is also used to adjust the light level of dimmed loads.

## Features

- Remotely reconfigures and reports DLM occupancy sensor parameters: PIR and ultrasonic sensitivity; time delay; walk through mode; trigger mode (for dual technology sensors)
- Remotely reconfigures and reports DLM dimming parameters: load type (dim/switch); low/high trim; preset on level; lamp burn-in

## Configuration and Personalization

The LMCT-100 simplifies the replication of occupancy sensor settings from one DLM local network to another and facilitates scene setting. It can store up to nine sensor profiles and assign them to sensors in any DLM local network. For projects where identical settings may be desired across a large number of spaces, this capability provides a streamlined method of configuration. Settings can be copied throughout a building or in different buildings. The LMCT also allows manual adjustment of individual load levels. This powerful feature allows different lighting scenes to be set and stored without the need for dimming switches in each space. Scenes can be recalled by scene switches or multi-button switches configured for scene control.

## Applications

Designers and installers can use the LMCT-100 to ensure conformity with design intent. It simplifies changes to occupancy sensor settings, load configurations and dimming parameters by making the adjustment process ladder-free. An LMCT-100 is required for calibrating the LMLS-500 photosensor. The self-calibrating LMLS-400 does not require the use of an LMCT-100 unless operating parameters need to be adjusted. The LMCT-100 is also required for configuration and maintenance of LMCP series relay control panels.

- Manually adjusts light level of dimmed loads to facilitate scene setting
- Remotely configures, reconfigures and reports DLM photosensor settings: light levels; operating mode (on/off, bi-level, tri-level, dimming); setpoints; time delays; fade times; test mode
- RoHS compliant

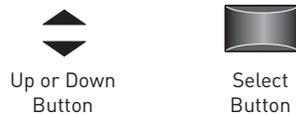
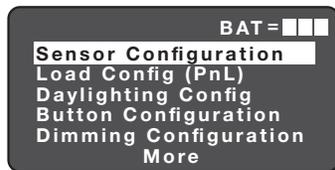
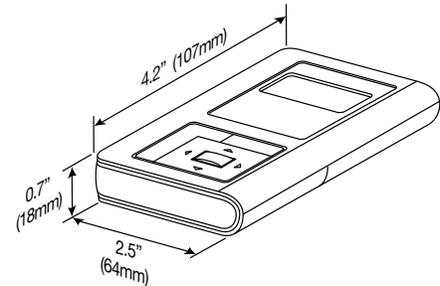
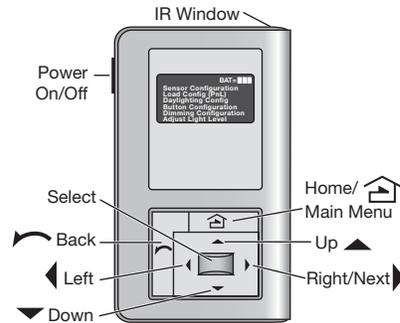


## Specifications

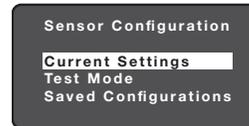
- Three AAA 1.5 volt batteries (included)
- OLED display 1.4"W x .75"H (36mm x 19mm)
- Infrared (IR) transceiver (36kHz frequency)
- IR range: up to 32' (10m)
- Includes carrying case with belt clip
- Operating temperature: 32-104°F (0-40°C)
- FCC part 15 compliant
- Five year warranty

## Configuration Menus

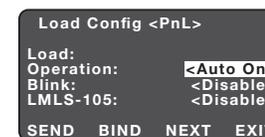
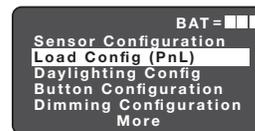
### LMCT-100 Handheld Remote with Menu Screens



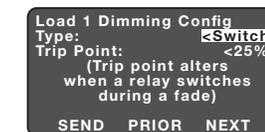
The Home (or Main) menu displays after the power-up process completes. It contains information on the battery status and six menu choices.



The Sensor Configuration function enables users to change sensor parameters, including time delay and sensitivity, save configurations, enter test mode and apply saved configurations.



The Load Configuration function (also referred to as Push n' Learn) enables users to identify load numbers, view and change load parameters and load bindings to sensors.



The Dimming Configuration function enables users to customize parameters for performance and savings. Setting a high level trim below 100% saves energy and increases lamp life.



The Daylighting Configuration function enables users to initiate automatic calibration of the LMLS-400, calibrate the LMLS-500, and adjust setpoints and other parameters for both photosensors and enter test mode.

## Ordering Information

Catalog No.	Description
<input type="checkbox"/> LMCT-100	Digital Wireless Configuration Tool
<input type="checkbox"/> LMCT-100-U	Digital Wireless Configuration Tool, ARRA compliant*

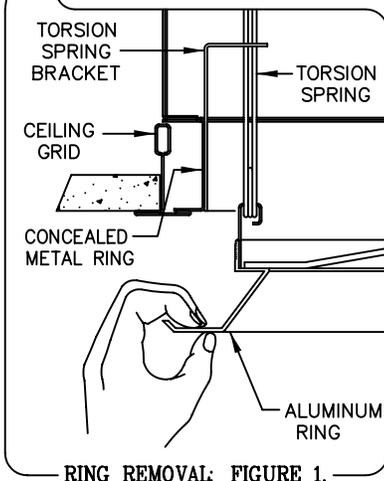
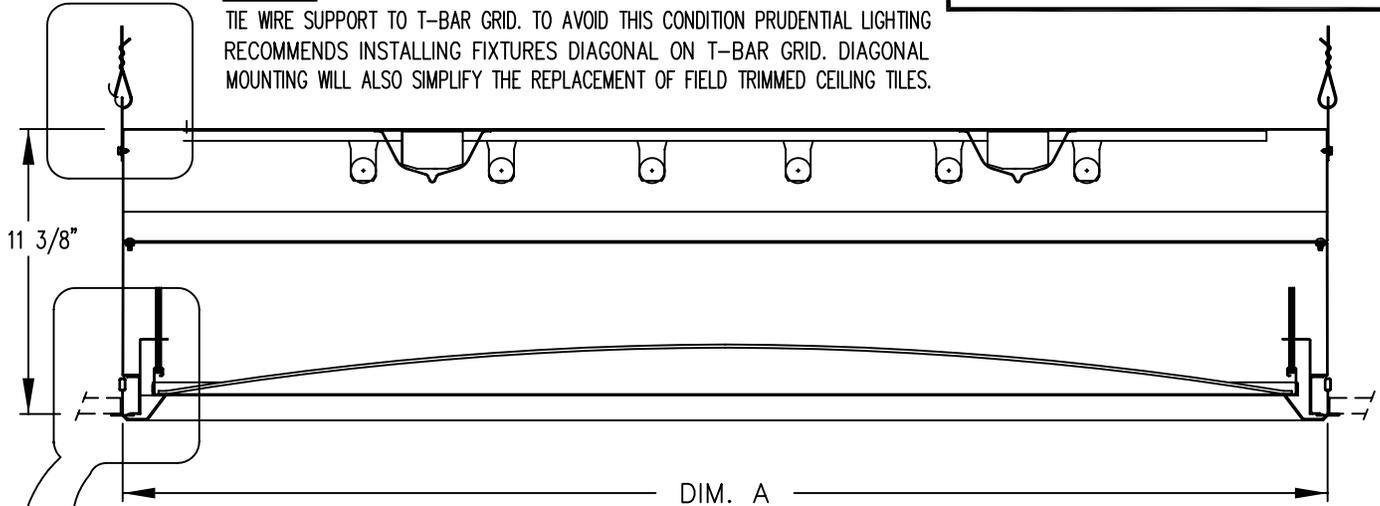
\*Product produced in the U.S.



# P8900 T-BAR (X1) INSTALLATION INSTRUCTIONS

**WARNING:** GROUND FIXTURE IN ACCORDANCE WITH LOCAL AND NATIONAL ELECTRICAL CODES. FAILURE TO DO SO MAY RESULT IN SERIOUS PERSONAL INJURY.

SEE FIGURE 4. **NOTE:** INSTALLING FIXTURES PARALLEL WITH T-GRID WILL LIMIT ACCESS OF THE WIRE SUPPORT TO T-BAR GRID. TO AVOID THIS CONDITION PRUDENTIAL LIGHTING RECOMMENDS INSTALLING FIXTURES DIAGONAL ON T-BAR GRID. DIAGONAL MOUNTING WILL ALSO SIMPLIFY THE REPLACEMENT OF FIELD TRIMMED CEILING TILES.



RING REMOVAL: FIGURE 1.

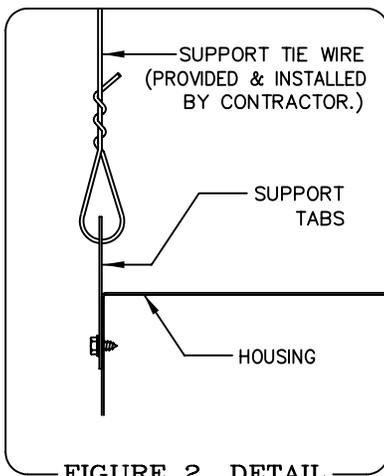


FIGURE 2. DETAIL

## ALUMINUM RING

REMOVE THE ALUMINUM RING FROM SQUARE HOUSING BY PULLING RING AWAY FROM HOUSING. WHEN RING STOPS AGAINST TORSION SPRING BRACKET, RELEASE TORSION SPRING BY HAND PRESSING TOWARD CENTER OF BRACKET. FRAME WILL DISENGAGE FROM BRACKET. (SEE FIGURE 1.)

## INSTALLING FIXTURES

1. REMOVE BALLAST COVERS FROM FIXTURE TO EXPOSE LEAD WIRES.
2. FASTEN SUPPORT TABS ON EACH CORNER WITH #8 SHEET METAL SCREWS PROVIDED. TIE FIXTURE SUPPORT TABS TO STRUCTURAL MEMBER. (SEE FIGURE 2 DETAIL.)
3. PLACE FIXTURE OVER TOP OF T-GRID CEILING. IN ORDER TO PROVIDE CLEARANCE FOR THE WIRE SUPPORT FROM GRID TO STRUCTURAL MEMBER, FIXTURE MUST BE TURNED DIAGONAL TO CEILING T-GRID. (SEE FIXTURE PLAN VIEWS.) 1-1/2" T-GRID SHOULD BE THE SAME HEIGHT AS THE CONCEALED METAL RING ON FIXTURE. BOTTOM FLANGE ON FIXTURE METAL RING SHOULD REST ON TOP OF T-GRID. (SEE FIGURE 1 DETAIL.) FIXTURE MUST BE TIED TO STRUCTURAL MEMBER INDEPENDENT FROM T-GRID.
4. TRIM CEILING TILES TO FIT AROUND RADIUS OF CONCEALED METAL RING. (SEE INSTALLED PICTORIAL VIEW.) TILES SHOULD REST ON TOP SURFACE OF CONCEALED METAL RING FLANGE. TEK SCREWS CAN BE USED TO DRILL THROUGH CONCEALED METAL RING AND INTO CEILING TILE IF REQUIRED. (SEE FIGURE 3 DETAIL). TEK SCREWS PROVIDED BY OTHERS.

## TEGULAR/SLOT GRID CEILING OPTION

FIELD INSTALLING A 2 PIECE TEGULAR BAND WILL PROVIDE A 3/8" TO 3/4" LOWER STOPPING LOCATION FOR THE EXTRUDED RING. PLACE TEGULAR BAND AGAINST INSIDE SURFACE OF CONCEALED METAL RING. BAND MUST BE APPROXIMATELY 1/2" LOWER THAN T-BAR GRID. USE 4 TEK SCREWS TO SECURE BAND IN PLACE. REPLACE CEILING TILES. REPLACE EXTRUDED

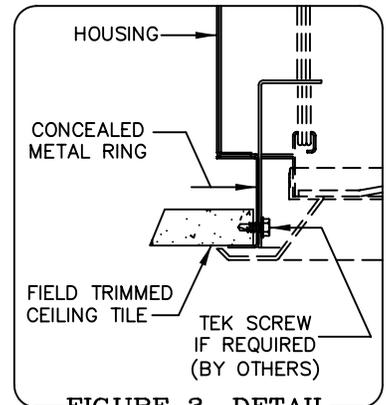


FIGURE 3. DETAIL

RING BY INSERTING TORSION SPRINGS INTO SLOTS ON TORSION SPRING BRACKET. IF GAPS ARE VISIBLE BETWEEN CEILING AND RING REMOVE EXTRUDED RING AND LOOSEN TEK SCREWS FOR VERTICAL ADJUSTMENT. (SEE FIGURE 4 DETAIL.)

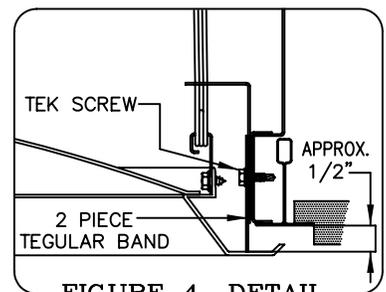


FIGURE 4. DETAIL

5. MAKE ALL WIRING CONNECTIONS AND REPLACE FIXTURE BALLAST COVERS.
6. REPLACE THE ALUMINUM RING BY INSERTING TORSION SPRINGS INTO SLOTS ON TORSION SPRING BRACKET. PUSH ALUMINUM RING UPWARD UNTIL IT STOPS AGAINST CEILING SURFACE.



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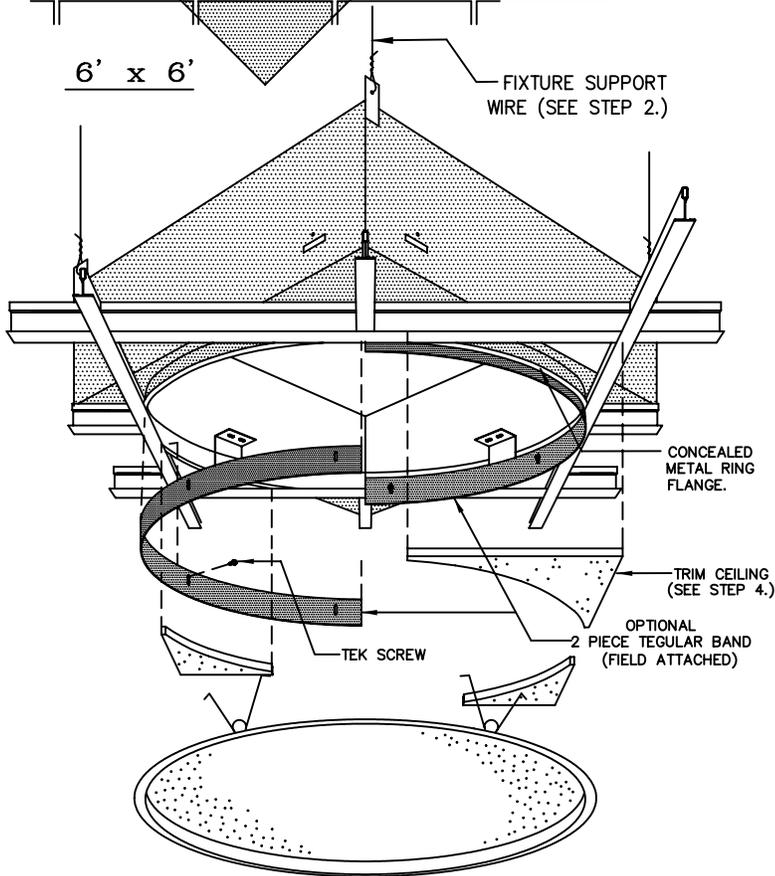
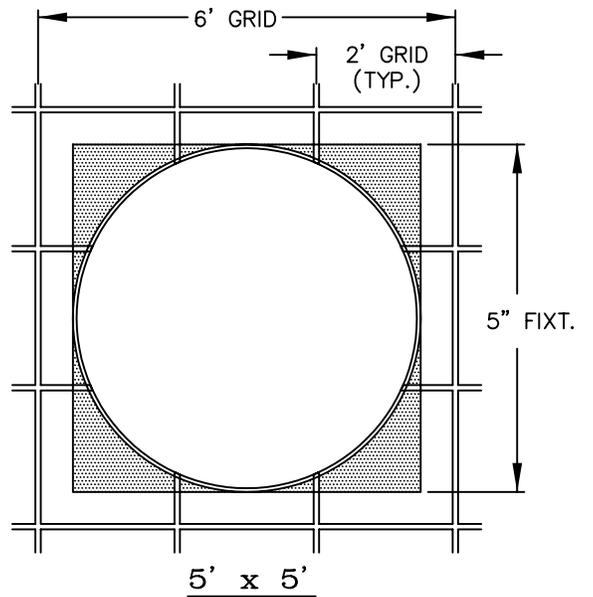
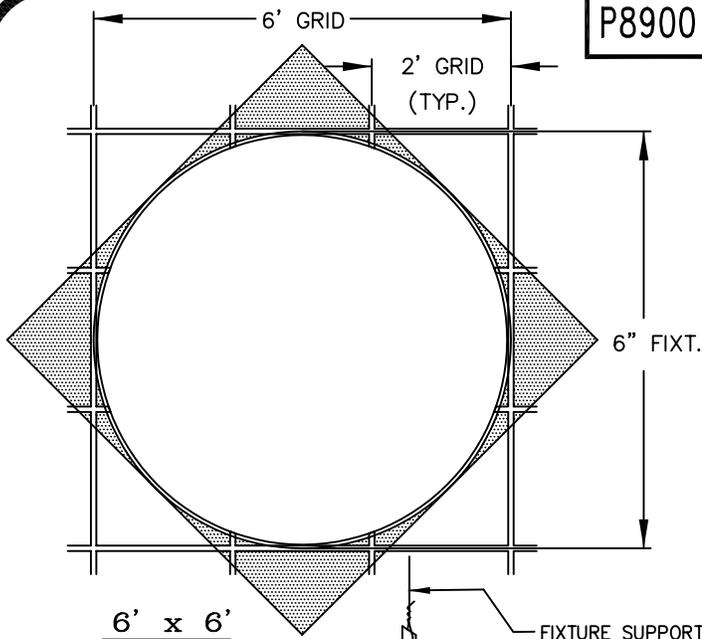
SHT. 1 OF 2

DWG. No. 42134

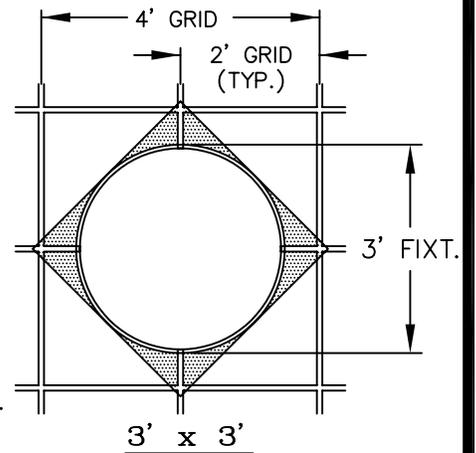
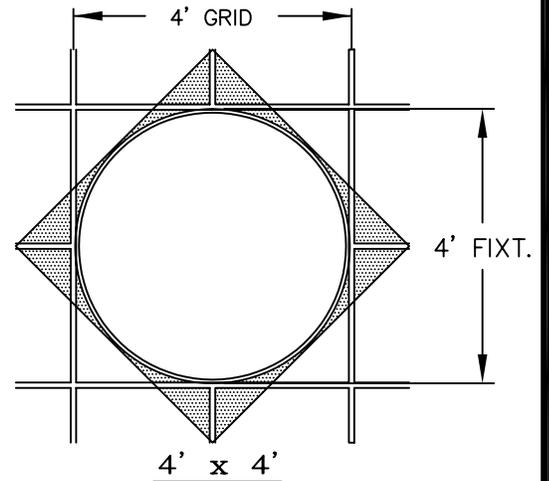
DISK No. ZD3

REV. B

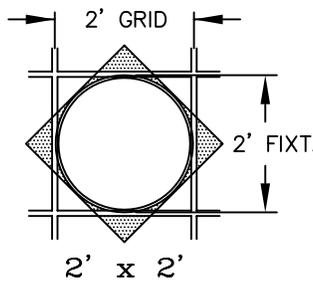
# P8900 T-BAR (X1) INSTALLATION INSTRUCTIONS



INSTALLED PICTORIAL VIEW



FIXTURE PLAN VIEWS  
(NO SCALE)



VARIOUS OPENING CHART			
HOUSING DIM. A	ALUMINUM RING SIZE	T-BAR GRID OPENING DIM. B	FIXTURE/GRID ORIENTATION
2' SQUARE	24"	2' X 2'	DIAGONAL
3' SQUARE	36"	4' X 4'	DIAGONAL
4' SQUARE	48"	4' X 4'	DIAGONAL
5' SQUARE	60"	6' X 6'	DIAGONAL/PARALLEL
6' SQUARE	72"	6' X 6'	DIAGONAL



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SHT. 2 OF 2

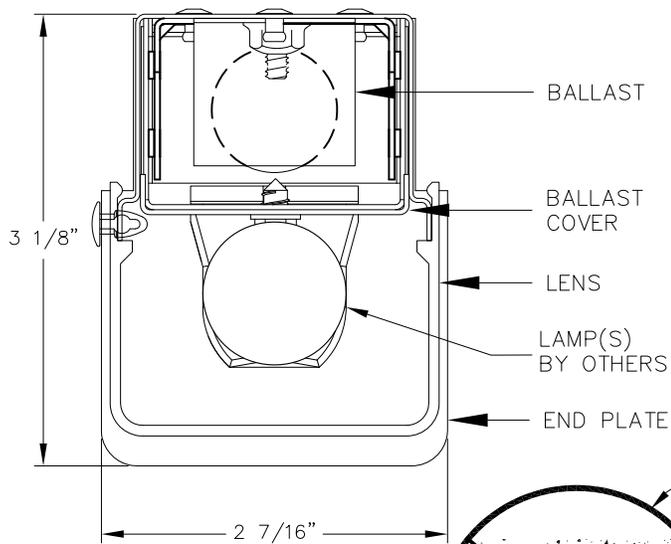
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DISK No. ZD3

REV. B

# SNAP INSTALLATION INSTRUCTIONS

## FIXTURE MOUNTING



CROSS SECTION

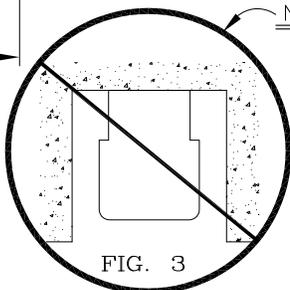
- 1- **REMOVING LENS:** START AT END OF FIXTURE. PLACE BOTH THUMBS ON EDGE OF END PLATE OR CENTER PLATE OF 8' FIXTURE. PLACE FINGERS ON TOP EDGE OF LENS. SIMULTANEOUSLY PULL LENS OUTWARD AND DOWN WITH ALL FINGERS. (SEE FIG. 1)
- 2- REMOVE BALLAST COVER TO ACCESS BALLAST WIRES. PULL OUT END CAP/INTERMEDIATE CAP FOR INSTALLATION OF FIXTURES.
- 3- MAKE ALL WIRE CONNECTIONS AND REPLACE ALL REFLECTORS. SNAP ALL LENS, ONTO HOUSINGS.
- 4- **REPLACING LENS:** START AT END OF FIXTURE. ANGLE LENS SLIGHTLY DOWNWARDS. PLACE BOTH LENS TRACKS ONTO HOUSING EDGE WORKING TOWARDS ANGLED END. LENS SHOULD SNAP ONTO FIXTURE. (SEE FIG. 2)

**NOTE:** WHEN SURFACE/WALL MOUNTING, ALLOW SPACE AROUND FIXTURE TO ACCESS LAMP (MOUNTING HARDWARE BY OTHERS). (SEE FIG. 3)

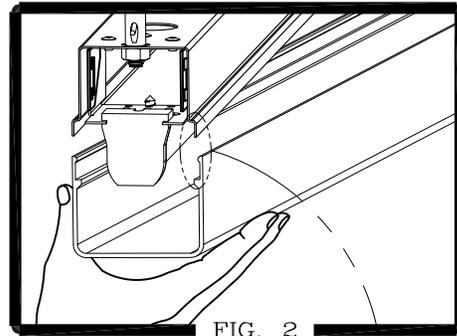
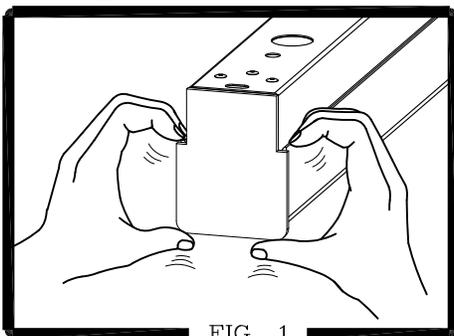
## CONTINUOUS ROWS :

- 1- ATTACH CABLE ONTO FAR END OF NEXT FIXTURE IN ROW. LIFT FIXTURE AND CABLE AND ATTACH TO SUPPORT HARDWARE ON CEILING SURFACE. LIFT OPPOSITE END OF FIXTURE TO FIRST (HANGING) FIXTURE. CONNECT ALL NECESSARY WIRES. INSERT INTERMEDIATE CAP INTO (HANGING) FIXTURE AND FASTEN INTERMEDIATE PLATE.

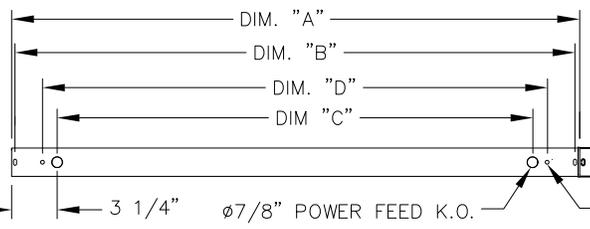
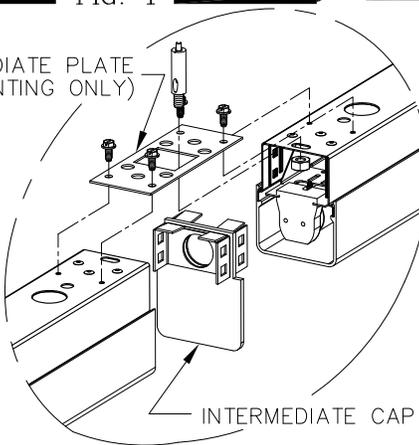
REFERENCE INSTRUCTION #S 42100 & 42101 FOR CABLE INSTALLATION



USE ROMEX CLAMP FOR SJT CORD (ROMEX CLAMP BY OTHERS)



INTERMEDIATE PLATE (CABLE MOUNTING ONLY)



MOUNTING DIM.

FIXT. LENGTH DIM. "A"	CABLE MNT. DIM. "B"	K.O. LOC. DIM. "C"	SURFACE MNT. DIM. "D"
2'	23 1/2"	ONE SIDE ONLY	19 1/4"
3'	35 1/2"	29 1/2"	31 1/4"
4'	47 1/2"	41 1/2"	43 1/4"
6'	71 1/2"	65 1/2"	67 1/4"
8'	95 1/2"	89 1/2"	91 1/4"

## INDIVIDUAL/CONTINUOUS ROW MOUNTING PLAN



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DRAWN BY: G. ROMO  
DATE: 04/6/10  
CHK.:  
DATE:

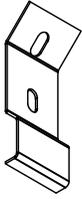
42163

DISK No. Z-3-B  
REV. D

# STREAM – GRID CEILING (X1) INSTALLATION INSTRUCTIONS

## WARNING:

GROUND FIXTURE IN ACCORDANCE WITH LOCAL AND NATIONAL ELECTRICAL CODES. FAILURE TO DO SO MAY RESULT IN SERIOUS PERSONAL INJURY.



A - T-BAR CLIP



B - #8 X  $\frac{3}{8}$ " SHEET METAL SCREW



C - 8-32 X 2" MACHINE BOLT



D - 8-32 U-NUT



E - ALIGNER SPLINE

**HOUSING INSTALLATION – GENERAL NOTES**  
LENGTH OF HOUSING/ROWS IS EQUAL TO CEILING GRID CENTERS. START/END HOUSING ARE NOTCHED ON ONE END TO COMPENSATE FOR TOP OF GRID.

WIRE TIE SUPPORT

B

A

C

D

E

6" T-BAR GRID CENTER

5-5/8"

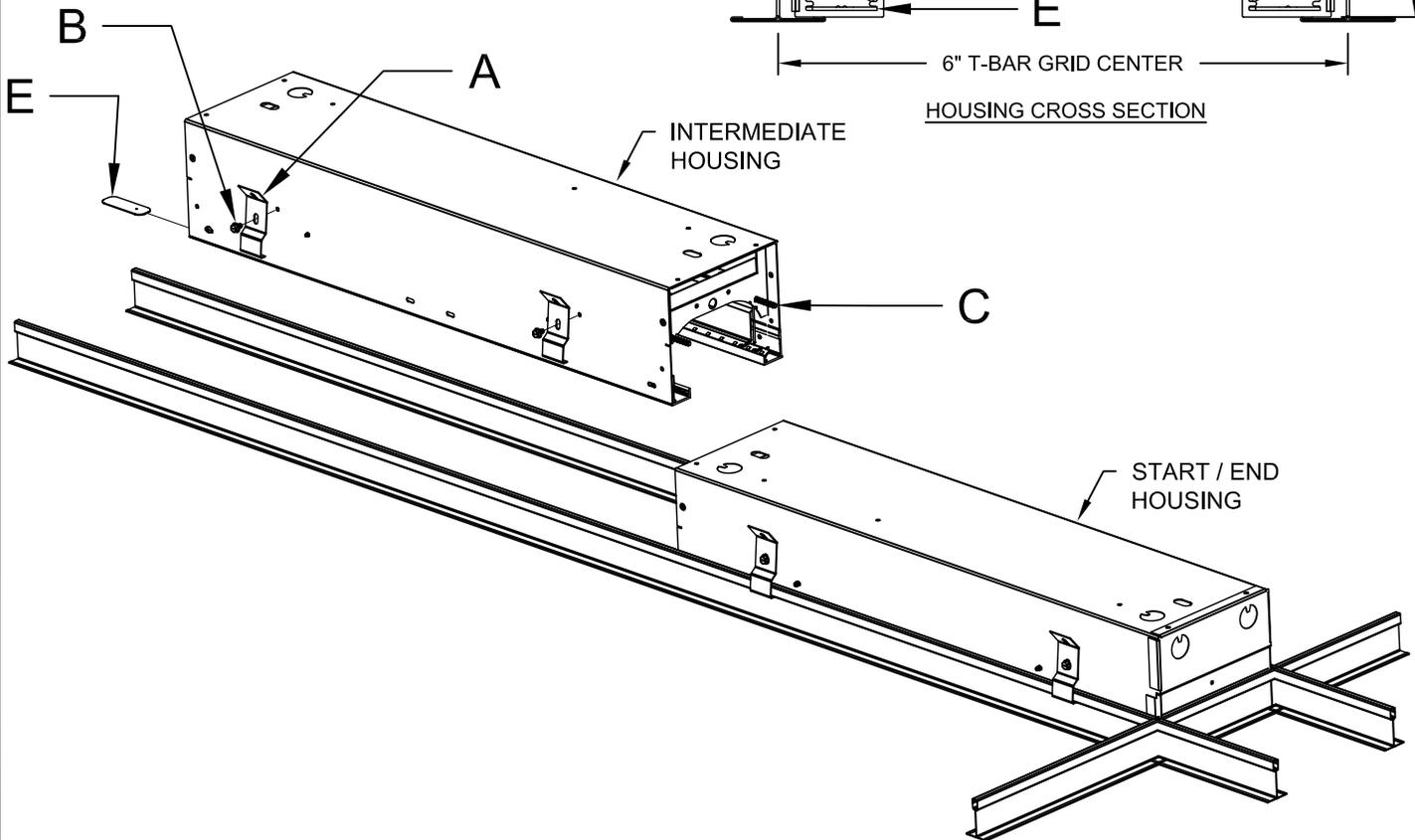
4-9/16"

HOUSING CROSS SECTION

INTERMEDIATE HOUSING

C

START / END HOUSING



1774 EAST 21ST STREET L.A. CA 90058  
TEL. (213)746-0360 FAX (213)746-8838

PRUDENTIAL LTG. WWW.PRULITE.COM

DRAWN BY:

C.J.K.

DATE

DWG. No.

DISK No.

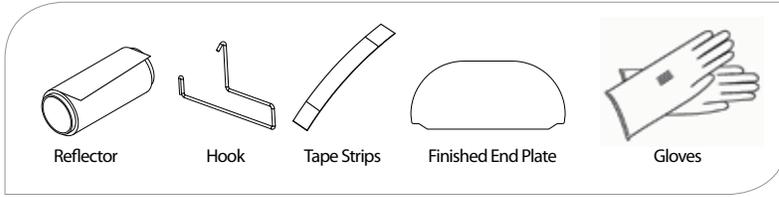
VAULT

PAGE

1 OF 3

DATE

REV.

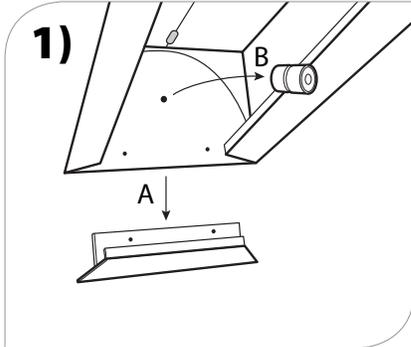


**WARNING:**

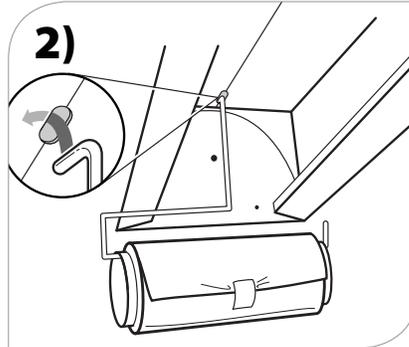
Ground fixture in accordance with local and national electrical codes. Failure to do so may result in serious personal injury.

**NOTE:**

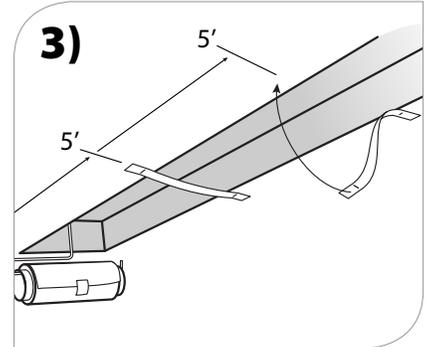
Test LEDs and confirm they are all lit before beginning Reflector install.



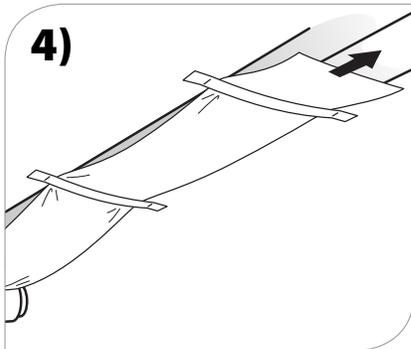
Remove trim (A) and magnet (B) from one end (do not remove A from X7 ceilings).



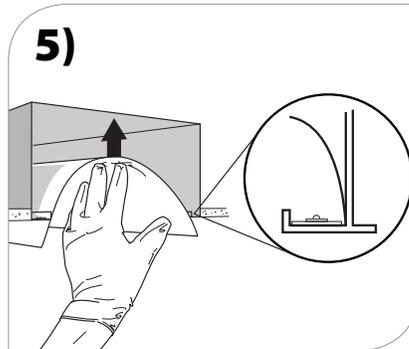
Hang reflector roll from same end using hook. Matte side of film will face down towards room when installed. (Skip this step on rows of 8' or less)



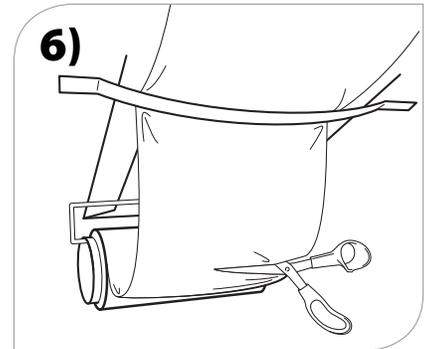
Apply tape strips provided about 5' apart along housing.  
**NOTE:** Wait at least 24 hours after painting before using tape strips



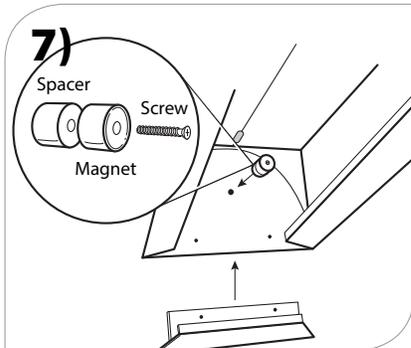
USE GLOVES PROVIDED. Pull reflector over entirety of housing row. Tighten roll to remove excess slack. Clamp roll to keep from unrolling.



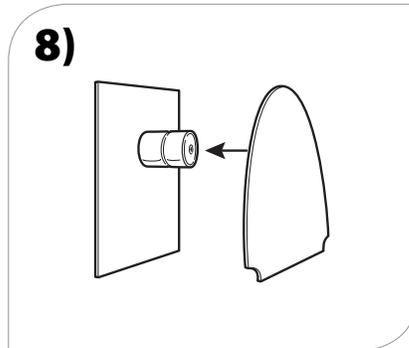
Push reflector into housing to proper position. Make sure no LED emitters are covered. Wire leads may need to be tucked away from emitters and reflector.



Cut reflector to fit — from side with excess reflector (hook & roll side). DO NOT UNDER-CUT. Make small cuts until reflector fits into housing, covering curved end plate.



Reinstall magnet and trim (except on trim-less X7 ceiling).



Install finish end plate to magnets on each end of row. Adjust end plate as needed to close gaps along reflector.

**CLEANING INSTRUCTIONS:**

Reflector film may be cleaned as needed. To avoid contaminating LED emitters, use only water and/or isopropyl alcohol solution on a clean wash cloth. Other cleaning chemicals could damage LED emitters.



**SECTION 01 11 00 – SUMMARY**

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

## 1.2 SUMMARY

- A. This Section includes the following:
  - 1. Work covered by the Contract Documents.
  - 2. Type of Contract.
  - 3. Work under other contracts.
  - 4. Owner-furnished products.
  - 5. Contractor's use of premises.
  - 6. Owner's occupancy requirements.
  - 7. Work restrictions.
- B. Related Sections include the following:
  - 1. Division 01 Section "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

## 1.3 WORK COVERED BY CONTRACT DOCUMENTS

- A. Project Identification:  
Lighting Upgrades for Oak Ridge Public Library
- B. Owner contact / User group:  
City Of Oak Ridge  
Municipal Building  
200 South Tulane Avenue  
Oak Ridge, TN 37830  
Contact : Pat Fallon - V | 865.425.1847
- C. Architect: Red Chair Architects / 220 W. Jackson Avenue / Knoxville, TN 37902
  - 1. Project Manager: Patrick Core.
- D. The Work consists of the following:
  - 1. Demolish and replace existing ceiling and lighting in the main reading room and other areas at Oak Ridge Public Library. At stacks, Contractor shall remove and replace light fixtures and existing ceiling shall remain. Portions of Work shall be constructed by Owner and other portions shall be constructed by Contractor.

## 1.4 TYPE OF CONTRACT

- A. Project will be constructed under a single prime contract.

## 1.5 WORK PHASES

- A. The Work shall be completed in one phase.

## 1.6 OWNER-FURNISHED PRODUCTS

- A. Owner will furnish products indicated on the drawings. The Work includes providing support systems to receive Owner's equipment and making plumbing, mechanical, and electrical connections.
  - 1. Owner will arrange for and deliver Shop Drawings, Product Data, and Samples to Contractor.
  - 2. Owner will arrange and pay for delivery of Owner-furnished items according to Contractor's Construction Schedule.
  - 3. After delivery, Owner will inspect delivered items for damage. Contractor shall be present for and assist in Owner's inspection.
  - 4. Owner will arrange for manufacturer's field services and for delivery of manufacturer's warranties to Contractor.
  - 5. Owner will furnish Contractor the earliest possible delivery date for Owner-furnished products. Using Owner-furnished earliest possible delivery dates, Contractor shall designate delivery dates of Owner-furnished items in Contractor's Construction Schedule.
  - 6. Contractor shall review Shop Drawings, Product Data, and Samples and return them to Architect noting discrepancies or anticipated problems in use of product.
  - 7. Contractor is responsible for receiving, unloading, and handling Owner-furnished items at Project site.
  - 8. Contractor is responsible for protecting Owner-furnished items from damage during storage and handling, including damage from exposure to the elements.
  - 9. If Owner-furnished items are damaged as a result of Contractor's operations, Contractor shall repair or replace them.
  - 10. If Owner-furnished items are damaged, defective, or missing as a result of Owner's operations, Owner will arrange for replacement.
  - 11. Contractor shall install and otherwise incorporate Owner-furnished items into the Work.

## 1.7 COORDINATION

- A. Prior to commencing construction, the Contractor will meet with the Owner's representative and the Architect's Office to coordinate construction schedules, site access, security, and any other activities affecting, or affected by this project.

## 1.8 CONTRACTORS USE OF PREMISES

- A. General: Contractor shall have full use of premises for construction operations, including use of Project site, during construction period, unless noted otherwise on the drawings. Contractor's use of premises is limited only by Owner's right to perform work or to retain other contractors on portions of Project. Do not disturb portions of the site that are identified on the drawings not to be disturbed.

## 1.9 OWNER'S OCCUPANCY REQUIREMENTS

- A. Owner Occupancy of Completed Areas of Construction: Owner reserves the right to occupy completed areas of the site, before overall Substantial Completion. Such occupancy shall not constitute acceptance of the total Work.
  - 1. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied before Owner occupancy.

1.10 WORK RESTRICTIONS

- A. Non-smoking Building: Smoking is not permitted within the building or within 25 feet of entrances, operable windows, or outdoor air intakes. This smoking prohibition includes all tobacco/nicotine products including e-cigarettes and tobacco products.

1.11 SAFETY

- A. The Contractor shall at all times maintain a safe work environment for employees and others occupying the site.
- B. The Contractor is solely responsible for all safety matters, including the establishment and implementation of safety programs.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 11 00

**SECTION 01 29 00 – PAYMENT PROCEDURES****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Requirements:
  - 1. Section 012973 "Schedule of Values" for detailed requirements.

**1.3 DEFINITIONS**

- A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

**1.4 SCHEDULE OF VALUES**

- A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
  - 1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:
    - a. Application for Payment forms with Continuation Sheets.
    - b. Submittal schedule.
    - c. Items required to be indicated as separate activities in Contractor's construction schedule.
  - 2. Submit the schedule of values to Architect at earliest possible date, but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
- B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.
  - 1. Identification: Include the following Project identification on the schedule of values:
    - a. Project name and location.
    - b. Name of Architect.
    - c. Architect's project number.
    - d. Contractor's name and address.
    - e. Date of submittal.
  - 2. Arrange schedule of values consistent with format of AIA Document G703.
  - 3. Arrange the schedule of values in tabular form with separate columns to indicate the following for each item listed:
    - a. Related Specification Section.
    - b. Description of the Work.
    - c. Change Orders (numbers) that affect value.

- d. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
  - 1) Labor.
  - 2) Materials.
  - 3) Equipment.
4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.
  - a. Include a separate line item for Project Close-Out documents / requirements. Refer to Section 01 29 73 "Schedule of Values" for the value based on the overall Contract Sum.
5. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
6. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
  - a. Differentiate between items stored on-site and items stored off-site. Include evidence of insurance.
7. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
8. Purchase Contracts: Provide a separate line item in the schedule of values for each purchase contract. Show line-item value of purchase contract. Indicate owner payments or deposits, if any, and balance to be paid by Contractor.
9. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
  - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the schedule of values or distributed as general overhead expense, at Contractor's option.
10. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

#### 1.5 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
  1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.
- C. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.
- D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
  1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
  2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
  3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
- E. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.

1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment, for stored materials.
  2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
  3. Provide summary documentation for stored materials indicating the following:
    - a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
    - b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
    - c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.
- F. Transmittal: For each application, submit one (1) signed and notarized electronic scan of an original Application for Payment to Architect by a method ensuring receipt. Application shall include waivers of lien and similar attachments if required.
1. Transmit each application with a transmittal form listing attachments and recording appropriate information about application.
- G. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
  2. Schedule of values.
  3. Contractor's construction schedule (preliminary if not final).
  4. Submittal schedule (preliminary if not final).
  5. Certificates of insurance and insurance policies.
  6. Performance and payment bonds.
- H. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
  2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- I. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Evidence of completion of Project closeout requirements.
  2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
  3. Updated final statement, accounting for final changes to the Contract Sum.
  4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
  5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
  6. AIA Document G707, "Consent of Surety to Final Payment."
  7. Evidence that claims have been settled.
  8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
  9. Final liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 29 00

**SECTION 01 29 73 – SCHEDULE OF VALUES**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. Work included: Provide a detailed breakdown of the agreed Contract Sum showing values allocated to each of the various parts of the Work, as specified herein and in other provisions of the Contract Documents.
- B. Related Work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions and Sections in Division 01 of these Specifications.
  - 2. Schedule of Values as required by the General Conditions.

**1.2 QUALITY ASSURANCE**

- A. Use standardized means to assure arithmetical accuracy of the sums described.
- B. When so required by the Architect, provide copies of the subcontracts or other data acceptable to the Architect, substantiating the sums described.
- C. Use accurate amounts reflecting costs allocable to the various portions of the Work without front end loading.

**1.3 SUBMITTALS**

- A. Not less than fourteen (14) days prior to submittal of the first Application for Payment, submit a proposed Schedule of Values to the Architect broken down by each individual Section included the Project Manual.
  - 1. Meet with the Architect and determine additional data, if any, required to be submitted.
  - 2. Secure the Architect's approval of the Schedule of Values prior to submitting first Application for Payment.
  - 3. Once Schedule of Values is approved, no further changes will be made to it, other than by listed modifications, entered as line items or to correct any errors which may be discovered.
  - 4. The approved Schedule of Values shall be submitted as Continuation Sheets accompanying each Application for Payment.
- B. Documentation and Close-Out
  - 1. To protect the Owner from the significant liability and arduous accounting efforts required by lingering documentation and close-out work, the Schedule of Values shall provide a separate line item titled "Documentation and Close-Out" to provide a value consistent with and appropriate to required documentation provisions throughout the Contract Documents. The value of the Documentation and Close-Out line item shall not be less than the following:

<u>For a total Contract Sum of:</u>	<u>Documentation and Close-Out amount:</u>
Less than \$20,000 .....	\$1,000
\$20,001 - \$75,000 .....	\$2,500
\$75,001 - \$100,000 .....	\$3,000
\$100,001 - \$200,000 .....	\$5,000
\$200,001 - \$350,000 .....	\$7,500

\$350,001 - \$500,000 .....	\$12,500
\$500,001 - \$1,000,000 .....	\$25,000
\$1,000,001 - \$1,500,000 .....	\$37,500
\$1,500,001 - \$2,000,000 .....	\$45,000
\$2,000,001 - \$3,000,000 .....	\$60,000
For each additional \$1,000,000 .....	add an additional \$10,000

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 29 73

**SECTION 01 33 00 – SUBMITTAL PROCEDURES****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Requirements:
  - 1. Section 012900 "Payment Procedures" for submitting Applications for Payment and the schedule of values.
  - 2. Section 017823 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
  - 3. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
  - 4. Section 017900 "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.
  - 5. Divisions 02 through 49 Sections for specific requirements for submittals in those Sections.
- C. Make submittals required by the Contract Documents, and revise and resubmit as necessary to establish compliance with the specified requirements.
- D. Work not included:
  - 1. Submittals not required by the Contract Documents will not be reviewed by the Architect.
  - 2. The Contractor may require his Subcontractors to provide drawings, setting diagrams, and similar information to coordinate the Work, but such data shall remain between the Contractor and his Subcontractors and will not be reviewed by the Architect.

**1.3 DEFINITIONS**

- A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."
- C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.
- D. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

## 1.4 ACTION SUBMITTALS

- A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.
1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
  2. Initial Submittal: Submit concurrently with startup construction schedule. Include submittals required during the first sixty (60) days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
  3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.
    - a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.
  4. Format: Arrange the following information in a tabular format:
    - a. Scheduled date for first submittal.
    - b. Specification Section number and title.
    - c. Submittal category: Action; informational.
    - d. Name of subcontractor.
    - e. Description of the Work covered.
    - f. Scheduled date for Architect's final release or approval.
    - g. Scheduled date of fabrication.
    - h. Scheduled dates for purchasing.
    - i. Scheduled dates for installation.
    - j. Activity or event number.
  5. Submit the Submittal Schedule at least fifteen (15) days prior to initial Application for Payment.

## 1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Architect's / Engineer's Digital Data Files: Upon receipt of the Contractor's written request, electronic copies of Architect's / Engineer's CAD files of the Contract Drawings will be provided to the Contractor for Contractor's use in connection with this specific Project, subject to the following conditions:
1. Upon executing a fully signed release form provided by the Architect / Engineer.
  2. Architect / Engineer will furnish Contractor the requested digital data drawing files of the Contract Drawings for use in preparing Shop Drawings.
    - a. Architect makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
  3. Receipt of Architect's / Engineer's electronic CAD files does not waive the responsibility of the Contractor to follow the Contract Documents. It is the responsibility of the Contractor to verify that the electronic information provided does not conflict with the requirements of the Contract Documents. In the event of conflict, the Contract Documents (hard copies) shall govern.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
  2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
  3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
  4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
    - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
1. Initial Review: Allow fifteen (15) working days for Architect's review, twenty (20) working days for multidisciplinary review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
  2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
  3. Resubmittal Review: Allow fifteen (15) working days for review of each resubmittal.
  4. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow twenty-one (21) working days for initial review of each submittal.
- D. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:
1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
  2. Name file with submittal number or other unique identifier, including revision identifier.
    - a. File name shall use six-digit Specification Section number followed by a dash and then a sequential two-digit number (e.g., 06 10 00-01). Resubmittals shall include an additional sequential number after a decimal point (e.g., 06 10 00-01.1).
  3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect.
  4. Transmittal Form for Electronic Submittals: Use electronic form acceptable to Owner, containing the following information:
    - a. Project name.
    - b. Date.
    - c. Name and address of Architect.
    - d. Name of Contractor.
    - e. Name of firm or entity that prepared submittal.
    - f. Names of subcontractor, manufacturer, and supplier.
    - g. Submittal number, including revision identifier.
      - 1) Submittal number shall use six-digit Specification Section number followed by a dash and then a sequential two-digit number (e.g., 06 10 00-01). Resubmittals shall include an additional sequential number after a decimal point (e.g., 06 10 00-01.1).
    - h. Category and type of submittal.
    - i. Submittal purpose and description.
    - j. Specification Section number and title.
    - k. Specification paragraph number or drawing designation and generic name for each of multiple items.
    - l. Drawing number and detail references, as appropriate.
    - m. Location(s) where product is to be installed, as appropriate.
    - n. Related physical samples submitted directly.
    - o. Indication of full or partial submittal.
    - p. Other necessary identification.
    - q. Remarks.
- E. Options: Identify options requiring selection by Architect.
- F. Transmittal: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return submittals, without review, received from sources other than Contractor.
1. Transmittal Form: Use AIA Document G810 or approved equal.
  2. Transmittal Form: Provide locations on form for the following information:
    - a. Project name.
    - b. Date.

- c. Destination (To:).
- d. Source (From:).
- e. Names of subcontractor, manufacturer, and supplier.
- f. Category and type of submittal.
- g. Submittal purpose and description.
- h. Submittal number.
- i. Specification Section number and title.
- j. Indication of full or partial submittal.
- k. Drawing number and detail references, as appropriate.
- l. Remarks.
- m. Signature of transmitter.

- G. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.
- H. Grouping of Submittals: Unless otherwise specified, make submittals in groups containing all associated items to assure that information is available for reviewing each item when it is received.
  - 1. Partial submittals may be rejected as not complying with the provisions of the Contract.
  - 2. The Contractor may be held liable for delays so occasioned.
- I. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
  - 1. Note date and content of previous submittal.
  - 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
  - 3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.
- J. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- K. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.
  - 1. Work installed from other than approved shop drawings or samples shall be removed and corrected at no additional cost to the Owner.

## 1.6 QUALITY ASSURANCE

- A. Coordination of submittals:
  - 1. Prior to each submittal, the Contractor shall carefully review and coordinate all aspects, including field dimensions, of each item being submitted.
  - 2. The Contractor shall verify that each item and the submittal for it conform in all respects with the specified requirements.
  - 3. By affixing the Contractor's approval stamp and authorized signature to each submittal, the Contractor certifies that this coordination has been performed.
  - 4. Submittals made without the Contractor's approval stamp and authorized signature, and that are not marked as reviewed for compliance with the Contract Documents will be returned to the Contractor by the Architect without review.
  - 5. Delays occasioned by failure of the Contractor to properly review, coordinate and submit in accordance with the requirements set forth for submittals shall be the responsibility of the Contractor.
  - 6. By approving and submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents that the Contractor has determined and verified materials, field measurements and field construction

criteria related thereto, or will do so, and has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

7. The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Architect.

## PART 2 - PRODUCTS

### 2.1 SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
  1. Post electronic submittals as PDF electronic files directly to Project Web site specifically established for Project.
    - a. Architect will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
  2. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
    - a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
  1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
  2. Mark each copy of each submittal to show which products and options are applicable.
  3. Include the following information, as applicable:
    - a. Manufacturer's catalog cuts.
    - b. Manufacturer's product specifications.
    - c. Standard color charts.
    - d. Statement of compliance with specified referenced standards.
    - e. Testing by recognized testing agency.
    - f. Application of testing agency labels and seals.
    - g. Notation of coordination requirements.
    - h. Availability and delivery time information.
  4. For equipment, include the following in addition to the above, as applicable:
    - a. Wiring diagrams showing factory-installed wiring.
    - b. Printed performance curves.
    - c. Operational range diagrams.
    - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
  5. Submit Product Data before or concurrent with Samples.
  6. Submit Product Data in the following format:
    - a. PDF electronic file.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittal based on Architect's digital data drawing files is otherwise permitted.
  1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
    - a. Identification of products.

- b. Schedules.
  - c. Compliance with specified standards.
  - d. Notation of coordination requirements.
  - e. Notation of dimensions established by field measurement.
  - f. Relationship and attachment to adjoining construction clearly indicated.
  - g. Seal and signature of professional engineer if specified.
  - h. Fabrication and installation drawings.
  - i. Roughing-in and setting diagrams.
  - j. Shopwork manufacturing instructions.
  - k. Templates and patterns.
  - l. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring and include power, signal, and control wiring.
2. The Contractor shall submit Shop Drawings in black or blue line on white background only, and samples for all items called for in the detail specifications.
  3. Scale and Measurements: Make Shop Drawings accurately to a scale sufficiently large to show all pertinent aspects of the item and its method of connection to the Work. Where materials are interdependent, show adjacent materials to verify dimensional and clearance conditions. Such coordination of materials is the responsibility of the Contractor to determine.
  4. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches, but no larger than 30 by 42 inches.
  5. Submit Shop Drawings in the following format:
    - a. PDF electronic file.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
  2. Provide Samples that are representative of article proposed to be provided. Identify as described under "Identification of Submittals" below.
  3. Identification: Attach label on unexposed side of Samples that includes the following:
    - a. Generic description of Sample.
    - b. Product name and name of manufacturer.
    - c. Sample source.
    - d. Number and title of applicable Specification Section.
    - e. Submittal number, including revision identifier.
      - 1) Submittal number shall use six-digit Specification Section number followed by a dash and then a sequential two-digit number (e.g., 06 10 00-01). Resubmittals shall include an additional sequential number after a decimal point (e.g., 06 10 00-01.1).
    - f. Specification paragraph number and generic name of each item.
  4. For projects where electronic submittals are required, provide corresponding electronic submittal of Sample transmittal, digital image file illustrating Sample characteristics, and identification information for record.
  5. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
    - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
    - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
  6. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.

- a. Number of Samples: Submit two (2) full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return one (1) submittal with options selected.
7. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
  - a. Number of Samples: Submit three (3) sets of Samples. Architect will retain two (2) Sample sets; remainder will be returned.
    - 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
    - 2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three (3) sets of paired units that show approximate limits of variations.
- E. Colors and Patterns: Unless the precise color and pattern is specifically called out in the Contract Documents, and whenever a choice of color or pattern is available in the specified products, submit accurate color and pattern charts to the Architect for selection. Installation of colors or textures that have not been approved by the Architect shall be replaced with approved colors or patterns at no additional cost to the Owner.
- F. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
  1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
  2. Manufacturer and product name, and model number if applicable.
  3. Number and name of room or space.
  4. Location within room or space.
  5. Submit product schedule in the following format:
    - a. PDF electronic file.
- G. Application for Payment and Schedule of Values: Comply with requirements specified in Section 012900 "Payment Procedures."
- H. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
  1. Name, address, and telephone number of entity performing subcontract or supplying products.
  2. Number and title of related Specification Section(s) covered by subcontract.
  3. Drawing number and detail references, as appropriate, covered by subcontract.
  4. Submit subcontract list in the following format:
    - a. PDF electronic file.
- I. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 017700 "Closeout Procedures."
- J. Maintenance Data: Comply with requirements specified in Section 017823 "Operation and Maintenance Data."
- K. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.

- L. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.
- M. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- N. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- O. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- P. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- Q. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- R. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- S. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
  - 1. Name of evaluation organization.
  - 2. Date of evaluation.
  - 3. Time period when report is in effect.
  - 4. Product and manufacturers' names.
  - 5. Description of product.
  - 6. Test procedures and results.
  - 7. Limitations of use.
- T. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- U. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- V. Maintenance Data: Comply with requirements specified in Division 01 Section "Operation and Maintenance Data."
- W. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.
- X. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer.

- Y. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:
  - 1. Statement on condition of substrates and their acceptability for installation of product.
  - 2. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
  - 3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
- Z. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.
- AA. Material Safety Data Sheets (MSDSs): Submit information directly to Owner; do not submit to Architect.
  - 1. Architect will not review submittals that include MSDSs and will return them for resubmittal.
  - 2. Submit to City of Oak Ridge Risk Manager  
Cindi Gordon  
cgordon@oakridgetn.gov  
865-425-3564
  - 3. Contractor shall submit in a timely fashion to allow for Owner review. Owner shall review and give a 24 hour notice to Owner's employees.

## PART 3 - EXECUTION

### 3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Project Closeout and Maintenance Material Submittals: See requirements in Section 017700 "Closeout Procedures."
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

### 3.2 ARCHITECT'S REVIEW

- A. Review and approval by the Architect of submittals does not relieve the Contractor from responsibility for errors which may exist in the submitted data or for errors in the Work resulting there from. Correction of such errors is the sole responsibility of the Contractor at no additional cost to the Owner.

### 3.3 ARCHITECT'S ACTION

- A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.

- B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or revisions required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken.
- C. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
- D. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect. If partial submittals have not been prior approved by the Architect, they will be considered non-responsive, and will be returned without review.
- E. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- F. Submittals not required by the Contract Documents may be returned by the Architect without action.

END OF SECTION 01 33 00

**SECTION 01 41 00 – REGULATORY REQUIREMENTS****PART 1 - GENERAL****1.1 CODES**

- A. Work shall conform to the requirements of the adopted codes and legislation listed below.
  - 1. 2012 International Building Code
  - 2. 2012 International Plumbing Code
  - 3. 2011 National Electrical Code
  - 4. 2012 International Mechanical Code
  - 5. 2012 International Fire Code
  - 6. 2012 International Residential Code
  - 7. 2009 International Energy Conservation Code
  - 8. 2009 Accessible and Usable Buildings and Facilities Code (ICC A117.1-2009)

**1.2 MATERIAL AND TESTING STANDARDS**

- A. Components of the Work shall conform to requirements of American Society for Testing and Materials (ASTM) standards, American National Standards Institute (ANSI) standards, and trade association standards, as listed in the various other sections of the specifications.

**PART 2 - PRODUCTS (Not Used)****PART 3 - EXECUTION (Not Used)****END OF SECTION 01 41 00**

**SECTION 01 50 00 – TEMPORARY FACILITIES AND CONTROLS****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
  - 1. Section 011000 "Summary" for work restrictions and limitations on utility interruptions.

**1.3 USE CHARGES**

- A. General: Existing facilities are available for Contractor to use through duration of Project at no charge per Owner's direction. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, occupants of Project, testing agencies, and authorities having jurisdiction.
- B. Sewer Service: Existing facilities are available for Contractor to use through duration of Project at no charge per Owner's direction.
- C. Water Service: Existing facilities are available for Contractor to use through duration of Project at no charge per Owner's direction.
- D. Electric Power Service: Existing facilities are available for Contractor to use through duration of Project at no charge per Owner's direction..

**1.4 INFORMATIONAL SUBMITTALS**

- A. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.
- B. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage.
  - 1. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.
  - 2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
  - 3. Indicate sequencing of work that requires water and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.

- C. Dust and HVAC Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Identify further options if proposed measures are later determined to be inadequate. Include the following:
1. Locations of dust-control partitions at each phase of work.
  2. HVAC system isolation schematic drawing.
  3. Location of proposed air-filtration system discharge.
  4. Waste handling procedures.
  5. Other dust-control measures.

## 1.5 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
- C. Accessible Temporary Egress: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

## 1.6 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Chain-Link Fencing: Minimum 2-inch, 0.148-inch- thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch- OD line posts and 2-7/8-inch- OD corner and pull posts, with 1-5/8-inch- OD top rails.
- B. Portable Chain-Link Fencing: Minimum 2-inch, 0.148-inch- thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch- OD line posts and 2-7/8-inch- OD corner and pull posts, with 1-5/8-inch- OD top and bottom rails. Provide concrete bases for supporting posts.
- C. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil minimum thickness, with flame-spread rating of 15 or less per ASTM E 84 and passing NFPA 701 Test Method 2.
- D. Dust-Control Adhesive-Surface Walk-off Mats: Provide mats minimum 36 by 60 inches.
- E. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.

### 2.2 TEMPORARY FACILITIES

- A. Field Offices, General: Superintendent shall operate within existing building. Contractor to coordinate with Owner.

- B. Common-Use Field Office: Of sufficient size to accommodate needs of Owner, Architect, and construction personnel office activities and to accommodate Project meetings specified in other Division 01 Sections. Keep office clean and orderly. Furnish and equip offices as follows:
  - 1. Furniture required for Project-site documents including file cabinets, plan tables, plan racks, and bookcases.
  - 2. Conference room of sufficient size to accommodate meetings of a minimum 10 individuals. Provide electrical power service and 120-V ac duplex receptacles, with no fewer than one receptacle on each wall. Furnish room with conference table and chairs.
  - 3. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F.
  - 4. Lighting fixtures capable of maintaining average illumination of 20 fc at desk height.
- C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
  - 1. Store combustible materials apart from building.

### 2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
  - 1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
  - 2. Heating Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.
  - 3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return-air grille in system and remove at end of construction and clean HVAC system as required in Section 017700 "Closeout Procedures".
- C. Air-Filtration Units: Primary and secondary HEPA-filter-equipped portable units with four-stage filtration. Provide single switch for emergency shutoff. Configure to run continuously.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
  - 1. Locate facilities to limit site disturbance as specified in Section 011000 "Summary."
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

### 3.2 TEMPORARY UTILITY INSTALLATION

- A. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
- B. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high

humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.

- C. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.
  - 1. Prior to commencing work, isolate the HVAC system in area where work is to be performed according to coordination drawings.
    - a. Disconnect supply and return ductwork in work area from HVAC systems servicing occupied areas.
    - b. Maintain negative air pressure within work area using HEPA-equipped air-filtration units, starting with commencement of temporary partition construction, and continuing until removal of temporary partitions is complete.
  - 2. Maintain dust partitions during the Work. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust-containment devices.
  - 3. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.
- D. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
  - 1. Provide dehumidification systems when required to reduce substrate moisture levels to level required to allow installation or application of finishes.
- E. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
  - 1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

### 3.3 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
  - 1. Provide construction for temporary offices, shops, and sheds located within construction area or within 30 feet of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.
  - 2. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.
- B. Traffic Controls: Comply with requirements of authorities having jurisdiction.
  - 1. Protect existing site improvements to remain including curbs, pavement, and utilities.
  - 2. Maintain access for fire-fighting equipment and access to fire hydrants.
- C. Parking: Coordinate with Owner for temporary parking areas for construction personnel.
- D. Signs: Provide Project signs as directed by Owner.
  - 1. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.
    - a. Provide temporary, directional signs for construction personnel and visitors.
  - 2. Maintain signs so they are legible at all times.
- E. Waste Disposal Facilities: Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."

- F. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 017300 "Execution."
- G. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
  - 1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.
- H. Temporary Use of Permanent Stairs: Use of new stairs for construction traffic will be permitted, provided stairs and railings are protected and finishes restored to new condition at time of Substantial Completion.

### 3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
  - 1. Comply with work restrictions specified in Section 011000 "Summary."
- C. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.
- D. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- E. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
- F. Temporary Partitions: Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate areas occupied by Owner from fumes and noise.
  - 1. Construct dustproof partitions with gypsum wallboard with joints taped on both sides (occupied side and fire-construction operations side)
  - 2. Construct dustproof partitions with two layers of 6-mil polyethylene sheet on each side. Cover floor with two layers of 6-mil polyethylene sheet, extending sheets 18 inches up the sidewalls. Overlap and tape full length of joints.
  - 3. Where fire-resistance-rated temporary partitions are indicated or are required by authorities having jurisdiction, construct partitions according to the rated assemblies.
  - 4. Insulate partitions to control noise transmission to occupied areas.
  - 5. Seal joints and perimeter. Equip partitions with gasketed dustproof doors and security locks where openings are required.
  - 6. Protect air-handling equipment.
  - 7. Provide walk-off mats at each entrance through temporary partition.
- G. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
  - 1. Prohibit smoking in construction areas.
  - 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.

3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

### 3.5 MOISTURE AND MOLD CONTROL

- A. Contractor's Moisture-Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.
- B. Controlled Construction Phase of Construction: Maintain as follows:
  1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
  2. Use permanent HVAC system to control humidity.
  3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.
    - a. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for 48 hours are considered defective.
    - b. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record readings beginning at time of exposure and continuing daily for 48 hours. Identify materials containing moisture levels higher than allowed. Report findings in writing to Architect.
    - c. Remove materials that cannot be completely restored to their manufactured moisture level within 48 hours.

### 3.6 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
  1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
  1. Materials and facilities that constitute temporary facilities are property of Contractor.
  2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

END OF SECTION 01 50 00

**SECTION 01 73 00 – EXECUTION****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
  - 1. Installation of the Work.
  - 2. Cutting and patching.
  - 3. Coordination of Owner-installed products.
  - 4. Progress cleaning.
  - 5. Starting and adjusting.
  - 6. Protection of installed construction.
- B. Related Requirements:
  - 1. Section 011000 "Summary" for limits on use of Project site.

**1.3 DEFINITIONS**

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

**PART 2 - PRODUCTS****2.1 MATERIALS**

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
  - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials.

**PART 3 - EXECUTION**

### 3.1 EXAMINATION

- A. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
  - 1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
  - 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
  - 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- B. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
  - 1. Description of the Work.
  - 2. List of detrimental conditions, including substrates.
  - 3. List of unacceptable installation tolerances.
  - 4. Recommended corrections.
- C. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

### 3.2 PREPARATION

- A. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- B. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- C. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Section 013100 "Project Management and Coordination."

### 3.3 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
  - 1. Make vertical work plumb and make horizontal work level.
  - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
  - 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
  - 4. Maintain minimum headroom clearance of 96 inches in occupied spaces and in unoccupied spaces.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
  - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
  - 2. Allow for building movement, including thermal expansion and contraction.
  - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

#### 3.4 OWNER-INSTALLED PRODUCTS

- A. Site Access: Provide access to Project site for Owner's construction personnel.
- B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction personnel.
  - 1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
  - 2. Preinstallation Conferences: Include Owner's construction personnel at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction personnel if portions of the Work depend on Owner's construction.

#### 3.5 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
  - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
  - 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
  - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
    - a. Use containers intended for holding waste materials of type to be stored.
  - 4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.
- B. Site: Maintain Project site free of waste materials and debris.

- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
  - 1. Remove liquid spills promptly.
  - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 017419 "Construction Waste Management and Disposal."
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

### 3.6 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

### 3.7 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

## 3.8 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Division 01 Section "Cutting and Patching."
  - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Restore permanent facilities used during construction to their specified condition.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 01 73 00

**SECTION 01 73 29 – CUTTING AND PATCHING****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General Conditions and other Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. This Section includes procedural requirements for cutting and patching.
- B. Related Sections include the following:
  - 1. Divisions 02 through 49 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

**1.3 DEFINITIONS**

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other Work.
- B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation or removal of other Work.

**1.4 QUALITY ASSURANCE**

- A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.
- B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that result in increased maintenance or decreased operational life or safety.
- C. Miscellaneous Elements: Do not cut and patch miscellaneous elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
- D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

**PART 2 - PRODUCTS****2.1 MATERIALS**

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
  - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of in-place materials.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
  - 1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
  - 2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

#### 3.2 PREPARATION

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize or prevent interruption to occupied areas.

#### 3.3 PERFORMANCE

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
  - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Cutting: Cut in-place construction by sawing, drilling, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
  - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
  - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
  - 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill. Do not break or chip with hammering devices.
  - 4. Proceed with patching after construction operations requiring cutting are complete.
- C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
  2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
    - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
    - b. Restore damaged pipe covering to its original condition.
  3. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.
- D. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

END OF SECTION 01 73 29

**SECTION 01 74 00 – CLEANING****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General Conditions and other Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Work included: Throughout the construction period, maintain the buildings and site in a standard of cleanliness as described in this Section.
- B. Related Sections include the following:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions and Sections in Division 01 of these Specifications.
  - 2. In addition to standards described in this Section, comply with requirements for cleaning as described in pertinent other Sections of these Specifications.
  - 3. Division 01 Section "Closeout Procedures" for coordinating closeout of the Contract.

**1.3 QUALITY ASSURANCE**

- A. Conduct daily inspection, and more often if necessary, to verify that requirements for cleanliness are being met.
- B. In addition to the standards described in this Section, comply with pertinent requirements of governmental agencies having jurisdiction.
- C. Provide protective measures to prevent unnecessary staining of interior and exterior finish materials.

**PART 2 - PRODUCTS****2.1 CLEANING MATERIALS AND EQUIPMENT**

- A. Provide required personnel, equipment, and materials needed to maintain the specified standard of cleanliness.

**2.2 COMPATIBILITY**

- A. Use only the cleaning materials and equipment that are compatible with the surface being cleaned, as recommended by the manufacturer of the material.

**2.3 REFUSE CONTAINERS**

- A. Provide transportable refuse containers in one or more locations at the site for deposit of demolition materials, trash, debris and other materials.

- B. Transport all refuse away from the site to an approved landfill area and dispose of all materials in a legal manner.

## PART 3 - EXECUTION

### 3.1 PROGRESS CLEANING

- A. General:
  - 1. Retain stored items in an orderly arrangement allowing maximum access, not impeding traffic or drainage, and providing required protection of materials.
  - 2. Do not allow accumulation of scrap, debris, waste material, and other items not required for construction of this Work.
  - 3. At least twice each month, and more often if necessary, completely remove all scrap, debris, and waste material from the job site.
  - 4. Provide adequate storage for all items awaiting removal from the job site, observing requirements for fire protection and protection of the environment.
- B. Site:
  - 1. DAILY, and more often if necessary, inspect the site and pick up all scrap, debris, and waste material. Remove such items to the place designated for their storage. Prevent excavations, barricades, tools, equipment, accumulations of materials, water or debris from restricting exits or access to areas of refuge in the event of an emergency. Remove such impediments promptly and continuously from exit egress paths.
  - 2. WEEKLY, and more often if necessary, inspect all arrangements of materials stored on the site. Re-stack, tidy, or otherwise service arrangements to meet the requirements of subparagraph 3.1A.1 above.
  - 3. Maintain the site in a neat and orderly and safe condition at all times.
- C. Structures:
  - 1. DAILY maintain a clear, uncluttered, unobstructed access to exits at all times. Tools, equipment, materials, water or debris resulting from demolition or construction operations shall be removed promptly and continuously from exit egress paths.
  - 2. Provide protective measures to prevent soil splashing causing soil staining on lower portion of the building's exterior finishes.

### 3.2 FINAL CLEANING

- A. "Clean," for the purpose of this Article, and except as may be specifically provided otherwise, shall be interpreted as meaning the level of cleanliness generally provided by skilled cleaners using commercial quality building maintenance equipment and material.
- B. Prior to completion of the Work, remove from the job site all tools, surplus materials, equipment, scrap, debris, and waste. Conduct final progress cleaning as described in Article 3.1 above.
- C. Site:
  - 1. Unless otherwise specifically directed by the Architect, broom clean paved areas and sidewalks on the site and public paved areas adjacent to the site.
  - 2. Completely remove resultant debris.
- D. Structures:
  - 1. Interior:
    - a. Visually inspect surfaces and remove all traces of waste materials, smudges, dust, and other foreign matter.
    - b. Remove all traces of splashed materials from adjacent surfaces.

- E. Schedule final cleaning as approved by the Architect to enable the Owner to accept a completely clean Work ready for use.

3.3 CLEANING DURING OWNER'S OCCUPANCY

- A. Should the Owner occupy the Work or any portion thereof prior to its completion by the Contractor and acceptance by the Owner, responsibilities for interim and final cleaning shall be as determined by the Architect in accordance with the General Conditions of the Contract.

END OF SECTION 01 74 00

**SECTION 01 74 19 – CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for the following:
  - 1. Recycling nonhazardous demolition and construction waste.
  - 2. Disposing of nonhazardous demolition and construction waste.
- B. Related Requirements:
  - 1. Section 024119 "Selective Demolition" for disposition of waste resulting from partial demolition of buildings, structures, and site improvements.

**1.3 DEFINITIONS**

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

**1.4 PERFORMANCE REQUIREMENTS**

- A. General: Achieve end-of-Project rates for salvage/recycling of 75 percent by weight of total non-hazardous solid waste generated by the Work. Practice efficient waste management in the use of materials in the course of the Work. Use all reasonable means to divert construction and demolition waste from landfills and incinerators. Facilitate recycling and salvage of materials, including but not limited to the following:
  - 1. Demolition Waste:
    - a. Structural and miscellaneous steel.
    - b. Metal studs.
    - c. Gypsum board.
    - d. Acoustical tile and panels.
    - e. Piping.

- f. Electrical conduit.
- g. Copper wiring.
- 2. Construction Waste:
  - a. Metals.
  - b. Piping.
  - c. Electrical conduit.
  - d. Packaging: Regardless of salvage/recycle goal indicated in "General" Paragraph above, salvage or recycle 100 percent of the following uncontaminated packaging materials:
    - 1) Paper.
    - 2) Cardboard.
    - 3) Boxes.
    - 4) Plastic sheet and film.
    - 5) Polystyrene packaging.
    - 6) Wood crates.
    - 7) Plastic pails.

### 1.5 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

### PART 2 - PRODUCTS (Not Used)

### PART 3 - EXECUTION

#### 3.1 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Contractor.
- C. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.
- D. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.
  - 1. Provide appropriately marked containers or bins for controlling recyclable waste until removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
    - a. Inspect containers and bins for contamination and remove contaminated materials if found.
  - 2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
  - 3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
  - 4. Store components off the ground and protect from the weather.
  - 5. Remove recyclable waste from Owner's property and transport to recycling receiver or processor.

## 3.2 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
  - 1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
  - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
  - 1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
- D. Disposal: Remove waste materials from Owner's property and legally dispose of them.
- E. Materials to Owner: Coordinate with the Owner's Representative for excess or salvaged materials the Owner's Representative may wish to keep.

END OF SECTION 01 74 19

**SECTION 01 77 00 – CLOSEOUT PROCEDURES****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
  - 1. Substantial Completion procedures.
  - 2. Final completion procedures.
  - 3. Warranties.
  - 4. Final cleaning.
  - 5. Repair of the Work.
- B. Related Requirements:
  - 1. Section 017300 "Execution" for progress cleaning of Project site.
  - 2. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.
  - 3. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
  - 4. Section 017900 "Demonstration and Training" for requirements for instructing Owner's personnel.

**1.3 ACTION SUBMITTALS**

- A. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- B. Certified List of Incomplete Items: Final submittal at Final Completion.

**1.4 CLOSEOUT SUBMITTALS**

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.

**1.5 MAINTENANCE MATERIAL SUBMITTALS**

- A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

**1.6 SUBSTANTIAL COMPLETION PROCEDURES**

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected Contractor's punch list, indicating the value of each item on the list and reasons why the Work is incomplete.

- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
  2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, and operation and maintenance manuals.
  3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
  4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect. Label with manufacturer's name and model number where applicable.
    - a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Architect's signature for receipt of submittals.
- C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Advise Owner of pending insurance changeover requirements.
  2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
  3. Complete testing of light fixtures.
  4. Perform preventive maintenance on equipment used prior to Substantial Completion.
  5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 017900 "Demonstration and Training."
  6. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
  7. Complete final cleaning requirements.
  8. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
  2. Results of completed inspection will form the basis of requirements for final completion.

## 1.7 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:
1. Submit a final Application for Payment according to Section 012900 "Payment Procedures."
  2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
  3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.

- B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
  - 1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

## 1.8 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
  - 1. Organize list of spaces in sequential order.
  - 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
  - 3. Include the following information at the top of each page:
    - a. Project name.
    - b. Date.
    - c. Name of Architect.
    - d. Name of Contractor.
    - e. Page number.
  - 4. Submit list of incomplete items in the following format:
    - a. MS Excel electronic file. Architect will return annotated file.
    - b. PDF electronic file. Architect will return annotated file.

## 1.9 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
  - 1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
  - 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
  - 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
  - 4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
- C. Provide additional copies of each warranty to include in operation and maintenance manuals.

## PART 2 - PRODUCTS

## 2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

## PART 3 - EXECUTION

### 3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
  - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
    - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
    - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
    - c. Remove tools, construction equipment, machinery, and surplus material from Project site..
    - d. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
    - e. Sweep concrete floors broom clean in unoccupied spaces.
    - f. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
    - g. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
    - h. Remove labels that are not permanent.
    - i. Wipe surfaces of electrical equipment. Remove excess lubrication, paint droppings, and other foreign substances.
    - j. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
    - k. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
    - l. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
      - 1) Clean HVAC system in compliance with NADCA Standard 1992-01. Provide written report on completion of cleaning.
    - m. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
    - n. Leave Project clean and ready for occupancy.
- C. Construction Waste Disposal: Comply with waste disposal requirements in Section 017419 "Construction Waste Management and Disposal."

### 3.2 REPAIR OF THE WORK

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

- B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
  2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.
    - a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
  3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.

END OF SECTION 01 77 00

**SECTION 01 78 23 – OPERATION AND MAINTENANCE DATA****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
  - 1. Operation and maintenance documentation directory.
- B. Related Requirements:
  - 1. Section 013300 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.
  - 2. Section 017700 "Closeout Procedures" for submitting operation and maintenance manuals.
  - 3. Section 017839 "Project Record Documents" for preparing Record Drawings for operation and maintenance manuals.
  - 4. Divisions 02 through 49 Sections for specific operation and maintenance manual requirements for the Work in those Sections.

**1.3 DEFINITIONS**

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

**1.4 CLOSEOUT SUBMITTALS**

- A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
  - 1. Architect will comment on whether content of operations and maintenance submittals are acceptable.
  - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Format: Submit operations and maintenance manuals in the following format:
  - 1. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Architect.
    - a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
    - b. Enable inserted reviewer comments on draft submittals.
- C. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect will return copy with comments.

1. Correct or revise each manual to comply with Architect's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's comments and prior to commencing demonstration and training.

## PART 2 - PRODUCTS

### 2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

- A. Directory: Prepare a single, comprehensive directory of operation and maintenance data and materials, listing items and their location to facilitate ready access to desired information. Include a section in the directory for each of the following:
  1. List of documents.
  2. List of systems.
  3. List of equipment.
  4. Table of contents.
- B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
- C. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.
- D. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents.

### 2.2 REQUIREMENTS FOR OPERATION, AND MAINTENANCE MANUALS

- A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
  1. Title page.
  2. Table of contents.
  3. Manual contents.
- B. Title Page: Include the following information:
  1. Subject matter included in manual.
  2. Name and address of Project.
  3. Name and address of Owner.
  4. Date of submittal.
  5. Name and contact information for Contractor.
  6. Name and contact information for Architect.
  7. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
  8. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
  1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.

- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single manual.
- E. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
  - 1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
  - 2. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.

### 2.3 OPERATION MANUALS

- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
  - 1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
  - 2. Wiring diagrams.
  - 3. Control diagrams.
- B. Descriptions: Include the following:
  - 1. Product name and model number. Use designations for products indicated on Contract Documents.
  - 2. Manufacturer's name.
  - 3. Equipment identification with serial number of each component.
  - 4. Operating characteristics.
  - 5. Complete nomenclature and number of replacement parts.
- C. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

### 2.4 PRODUCT MAINTENANCE MANUALS

- A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- C. Product Information: Include the following, as applicable:
  - 1. Product name and model number.
  - 2. Manufacturer's name.
- D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
  - 1. Inspection procedures.
  - 2. Types of cleaning agents to be used and methods of cleaning.
  - 3. List of cleaning agents and methods of cleaning detrimental to product.

4. Schedule for routine cleaning and maintenance.
  5. Repair instructions.
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
1. Include procedures to follow and required notifications for warranty claims.

### PART 3 - EXECUTION

#### 3.1 MANUAL PREPARATION

- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.
- B. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- C. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
  2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- D. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
- E. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
1. Do not use original project record documents as part of operation and maintenance manuals.
  2. Comply with requirements of newly prepared record Drawings in Section 017839 "Project Record Documents."
- F. Comply with Section 017700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 01 78 23

**SECTION 01 78 39 – PROJECT RECORD DOCUMENTS****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for project record documents, including the following:
  - 1. Record Drawings.
  - 2. Record Specifications.
  - 3. Record Product Data.
  - 4. Miscellaneous record submittals.
- B. Related Requirements:
  - 1. Section 017700 "Closeout Procedures" for general closeout procedures.
  - 2. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.

**1.3 CLOSEOUT SUBMITTALS**

- A. Record Drawings: Comply with the following:
  - 1. Number of Copies: Submit two (2) set(s) of marked-up record prints.
  - 2. Number of Copies: Submit copies of record Drawings as follows:
    - a. Submittal:
      - 1) Submit PDF electronic files of scanned record prints.
      - 2) Include each drawing, whether or not changes and additional information were recorded.
- B. Record Specifications: Submit annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit annotated PDF electronic files and directories of each submittal.
  - 1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.
- D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit annotated PDF electronic files and directories of each submittal.
- E. Reports: Submit written report weekly indicating items incorporated into project record documents concurrent with progress of the Work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.

**PART 2 - PRODUCTS**

## 2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
    - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
    - b. Accurately record information in an acceptable drawing technique.
    - c. Record data as soon as possible after obtaining it.
    - d. Record and check the markup before enclosing concealed installations.
  2. Content: Types of items requiring marking include, but are not limited to, the following:
    - a. Dimensional changes to Drawings.
    - b. Revisions to details shown on Drawings.
    - c. Revisions to routing of piping and conduits.
    - d. Revisions to electrical circuitry.
    - e. Actual equipment locations.
    - f. Changes made by Change Order or Construction Change Directive.
    - g. Changes made following Architect's written orders.
    - h. Details not on the original Contract Drawings.
    - i. Field records for variable and concealed conditions.
    - j. Record information on the Work that is shown only schematically.
  3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
  4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
  5. Mark important additional information that was either shown schematically or omitted from original Drawings.
- B. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
  2. Format: Annotated PDF electronic file with comment function enabled.
  3. Identification: As follows:
    - a. Project name.
    - b. Date.
    - c. Designation "PROJECT RECORD DRAWINGS."
    - d. Name of Architect.
    - e. Name of Contractor.

## 2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
  2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.

3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
4. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
5. Note related Change Orders, record Product Data, and record Drawings where applicable.

B. Format: Submit record Specifications as annotated PDF electronic file.

## 2.3 RECORD PRODUCT DATA

A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.

B. Format: Submit record Product Data as annotated PDF electronic file.

1. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

## 2.4 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

B. Format: Submit miscellaneous record submittals as PDF electronic file.

1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

## PART 3 - EXECUTION

### 3.1 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.

B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's reference during normal working hours.

**END OF SECTION 01 78 39**

**SECTION 01 79 00 – DEMONSTRATION AND TRAINING****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
  - 1. Demonstration and training of operation of light systems controls.

**1.3 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For instructor.

**1.4 CLOSEOUT SUBMITTALS**

- A. Demonstration and Training Submittal: Submit one (1) copies within seven (7) days of training.
  - 1. Identification: Label with the following information:
    - a. Name of Project.
    - b. Name and address and contact information of instructor.
    - c. Name of Architect.
    - d. Name of Contractor.
    - e. Date of training session.
  - 2. At completion of training, submit complete training manual for Owner's use in PDF electronic file format on compact disc.

**1.5 QUALITY ASSURANCE**

- A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.
- B. Instructor Qualifications: A factory-authorized service representative, experienced in operation and maintenance procedures and training.

**1.6 COORDINATION**

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.

- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.

## PART 2 - PRODUCTS

### 2.1 INSTRUCTION PROGRAM

- A. Program Structure: Develop an instruction program that includes individual training modules for lighting fixture controls and for any associated equipment.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training material into a training manual.

### 3.2 INSTRUCTION

- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.
- B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
- C. Scheduling: Provide instruction at mutually agreed on times.
  - 1. Schedule training with Owner, through Architect, with at least fourteen (14) days' advance notice.
- D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual lighting fixtures and controls in-place. Conduct training using final operation and maintenance data submittals.
- E. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of an oral and a demonstration performance-based test.

END OF SECTION 01 79 00

**SECTION 02 41 19 – SELECTIVE STRUCTURE DEMOLITION****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY****A. Section Includes:**

1. Demolition and removal of selected portions of building or structure.
2. Salvage of existing items to be reused or recycled.

**B. Related Requirements:**

1. Section 011100 "Summary" for restrictions on the use of the premises, Owner-occupancy requirements, and phasing requirements.
2. Section 017300 "Execution" for cutting and patching procedures.

**1.3 DEFINITIONS**

- A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner.
- C. Remove and Reinstall: Detach items from existing construction, prepare for reuse as indicated on Drawings, and reinstall where indicated.
- D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

**1.4 MATERIALS OWNERSHIP**

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.

**1.5 PREINSTALLATION MEETINGS**

- A. Predemolition Conference: Conduct conference at Project site.

1. Inspect and discuss condition of construction to be selectively demolished.
2. Review structural load limitations of existing structure.
3. Review and finalize selective demolition items and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
4. Review areas where existing construction is to remain and requires protection.

#### 1.6 INFORMATIONAL SUBMITTALS

- A. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and for noise control. Indicate proposed locations and construction of barriers.
- B. Schedule of Selective Demolition Activities: Indicate the following:
  1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's, building manager's, and other tenants' on-site operations are uninterrupted.
  2. Interruption of utility services. Indicate how long utility services will be interrupted.
  3. Coordination for shutoff, capping, and continuation of utility services.
  4. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.
- C. Inventory: Submit a list of items to be removed and salvaged and deliver to Owner prior to start of demolition.

#### 1.7 CLOSEOUT SUBMITTALS

- A. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes as necessary.

#### 1.8 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- C. Hazardous Materials: It is not expected that additional hazardous materials will be encountered in the Work.
  1. If additional suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner.
- D. Storage or sale of removed items or materials on-site is not permitted.
- E. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

## 1.9 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties. Notify warrantor before proceeding.
- B. Notify warrantor on completion of selective demolition, and obtain documentation verifying that existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Review record documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in record documents.
- C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.
- E. Engage a professional engineer to perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.
  - 1. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

### 3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect against damage.

- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
  2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
  3. Disconnect, demolish, and remove equipment, and components indicated to be removed.
    - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
    - b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
    - c. Equipment to Be Removed: Disconnect and cap services and remove equipment.

### 3.3 PREPARATION

- A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with ongoing office operations.
- B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent spaces and facilities to remain.
1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
  2. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
  3. Cover and protect furniture, furnishings, and equipment that have not been removed.
  4. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 015000 "Temporary Facilities and Controls."
- C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

### 3.4 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
  2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.

3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
4. Maintain adequate ventilation when using cutting torches.
5. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
6. Dispose of demolished items and materials promptly. Comply with requirements in Section 017419 "Construction Waste Management and Disposal."

B. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

C. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition, cleaned, and reinstalled in their original locations after selective demolition operations are complete.

### 3.5 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

### 3.6 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

**END OF SECTION 02 41 19**

**SECTION 09 51 00 – ACOUSTICAL TILE CEILINGS****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. This Section includes acoustical panels and exposed suspension systems for ceilings.
- B. Products furnished, but not installed under this Section, include anchors, clips, and other ceiling attachment devices.

**1.3 DEFINITIONS**

- A. LR: Light Reflectance coefficient.
- B. NRC: Noise Reduction Coefficient.

**1.4 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Coordinate Drawings: Reflected ceiling plans drawn to scale and coordinating penetrations and ceiling-mounted items. Show the following:
  - 1. Ceiling suspension members.
  - 2. Method of attaching hangers to building structure.
  - 3. Ceiling-mounted items including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.
- C. Samples for Initial Selection: For components with factory-applied color finishes.
- D. Maintenance Data: For finishes to include in maintenance manuals.

**1.5 QUALITY ASSURANCE**

- A. Source Limitations: Obtain each type of acoustical ceiling panel and supporting suspension system through one source from a single manufacturer.
- B. Seismic Standard: Provide acoustical panel ceilings designed and installed to withstand the effects of earthquake motions according to the following:
  - 1. Standard for Ceiling Suspension Systems Requiring Seismic Restraint: Comply with ASTM E 580.
  - 2. CISCA's Guidelines for Systems Requiring Seismic Restraint: Comply with CISCA's "Guidelines for Seismic Restraint of Direct-Hung Suspended Ceiling Assemblies--Seismic Zones 3 & 4."

- C. Mockups: Build mockups to verify selections made under sample Submittals and to demonstrate aesthetic effects and qualities of materials and execution.
  - 1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical panels, suspension system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical panels, permit them to reach room temperature and stabilized moisture content.
- C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

#### 1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

#### 1.8 COORDINATION

- A. Coordinate layout and installation of acoustical panels and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

#### 1.9 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Acoustical Ceiling Panels: Full-size panels equal to 2.0 percent of quantity installed.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply for product selection:
  - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the manufacturers specified.

#### 2.2 ACOUSTICAL PANELS, GENERAL

- A. Acoustical Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectances, unless otherwise indicated.

## 2.3 ACOUSTICAL CEILING PANELS

### A. ACT-1

1. Surface Texture: Medium
2. Composition: Mineral Fiber
3. Color: White
4. Size: 24in X 24in X 5/8in
5. Edge Profile: Angular Tegular for interface with Prelude XL 15/16" Exposed Tee.
6. Noise Reduction Coefficient (NRC): ASTM C 423; Classified with UL label on product carton, 0.55.
7. Ceiling Attenuation Class (CAC): ASTM C 1414; Classified with UL label on product carton, 33
8. Emissions Testing: Section 01350 Protocol, < 13.5 ppb of formaldehyde when used under typical conditions required by ASHRAE Standard 62.1-2004, "Ventilation for Acceptable Indoor Air Quality"
9. Flame Spread: ASTM E 1264; Class A (UL)
10. Light Reflectance (LR): ASTM E 1477; White Panel: Light Reflectance: 0.82.
11. Dimensional Stability: HumiGuard Plus - Temperature is between 32°F (0° C) and 120°F (49° C). It is not necessary for the area to be enclosed or for HVAC systems to be functioning. All wet work (plastering, concrete, etc) must be complete and dry.
12. Antimicrobial Protection: BioBlock Plus - Resistance against the growth of mold/mildew and gram positive and gram negative odor and stain causing bacteria.
13. Acceptable Product: Cortega, 704 as manufactured by Armstrong World Industries.

## 2.4 METAL SUSPENSION SYSTEMS, GENERAL

Metal Suspension System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635.

- A. Acceptable Product: Prelude XL 15/16" Exposed Tee as manufactured by Armstrong World Industries, Inc to match existing.
- B. Finishes and Colors, General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Color: white. Provide manufacturer's standard factory-applied finish for type of system indicated.
  1. High-Humidity Finish: Comply with ASTM C 635 requirements for "Coating Classification for Severe Environment Performance" where high-humidity finishes are indicated.
- C. Attachment Devices: Size for five times the design load indicated in ASTM C 635, Table 1, "Direct Hung," unless otherwise indicated.
- D. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:
  1. Zinc-Coated Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.

## PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.

## 3.3 INSTALLATION, GENERAL

- A. General: Install acoustical panel ceilings to comply with ASTM C 636 and seismic requirements indicated, per manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."
- B. Suspend ceiling hangers from building's structural members and as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
4. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
5. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
6. Do not attach hangers to steel deck tabs.
7. Do not attach hangers to steel roof deck. Attach hangers to structural members.
8. Space hangers not more than 48 inches o.c. along each member supported directly from hangers, unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.

- C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns.

Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.

- D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.

1. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.
  2. Do not use exposed fasteners, including pop rivets, on moldings and trim.
- E. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace members with abraded finish and dented, bent, or kinked members.
- F. Install acoustical panels with undamaged edges and fit accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
1. Arrange directionally patterned acoustical panels as follows:
    - a. As indicated on reflected ceiling plans.
    - b. Install panels with pattern running in one direction parallel to long axis of space.
    - c. Install panels with pattern running in one direction parallel to short axis of space.
  2. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension system runners and moldings.
  3. For reveal-edged panels on suspension system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.
  4. For reveal-edged panels on suspension system members with box-shaped flanges, install panels with reveal surfaces in firm contact with suspension system surfaces and panel faces flush with bottom face of runners.
  5. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.

#### 3.4 CLEANING

- A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 09 51 00

**SECTION 26 01 00 - GENERAL PROVISIONS FOR ELECTRICAL SYSTEMS****PART 1 GENERAL****1.1 QUALITY ASSURANCE**

- A. Comply with applicable local, state and federal codes.
- B. Comply with applicable requirements of recognized industry associations which promulgate standards for the various trades.
- C. Employ only qualified journeymen for this work. Employ a competent qualified electrician to supervise the work.

**1.2 STANDARDS**

- A. Perform work specified in Division 26 in accordance with standards listed below including amendments or revisions. When these specifications are more stringent, they take precedence. In case of conflict, obtain a decision from the Designer.
- B. National Fire Codes (NFPA) including, but not limited to following:
  - 1. NFPA-70 - National Electrical Code.
  - 2. NFPA-72 - National Fire Alarm Code.
  - 3. NFPA-101 - Life Safety Code.
  - 4. NFPA-110 - Power Systems, Emergency and Standby.
- C. Applicable Codes:
  - 1. International Building Code.
  - 2. ANSI Handicapped Code - A117.1.
  - 3. Applicable State Energy Code.
- D. Should any work be construed as being contrary to or not conforming to aforementioned codes, such alleged conflict to be brought to attention of Architect in writing ten (10) days prior to bid date for review so that such point in question may be resolved. All work to be installed in strict conformity with applicable codes without additional cost to Owner.
- E. Contractor to submit and/or file with proper authorities all necessary specifications and drawings as required by governing authorities.

**1.3 SUBMITTALS**

- A. Within fifteen (15) days after contract has been awarded, Contractor to submit to Designer for review a complete list of materials, equipment, and accessories proposed for use, listing the item and manufacturer's name only.
- B. Based upon aforementioned approved listing, Contractor to submit seven (7) copies of COMPLETE BROCHURES AND SHOP DRAWINGS OF ALL MATERIALS, FIXTURES, AND EQUIPMENT that he proposes to use giving the names of manufacturers, trade name and specific catalog numbers.
- C. Brochures to be submitted in time to allow fifteen (15) days from date of receipt in Engineer's office before final approval or disapproval is required to meet construction schedule. Submittals to bear Contractor's stamp of approval evidencing he has examined and checked same and information contained therein is

accordance with contract requirements, and any deviations to be clearly marked. Approval of shop drawings not to be construed as permitting departure from the contractual documents.

- D. Above-mentioned brochures to be submitted and approved before any materials are ordered.
- E. Brochures: Submit complete descriptions, illustrations, specification data, etc. of all materials, fittings, devices, fixtures, special systems, etc., including the following:
  - 1. Lighting, including lamps.
- F. Proposed items to be clearly indicated when other items are shown on same sheet. When proposing items other than those specified, brochures to contain both specified item sheets and proposed item sheets for ease of comparison. On request from Designer, samples shall be submitted and/or set up, as directed, for inspection and approval. Samples will be returned to Contractor.

#### 1.4 OPERATING AND MAINTENANCE MANUALS

- A. Prior to final acceptance of the project, furnish to Owner complete bound sets of operation and maintenance manuals of instructions for operation and maintenance of all pieces of equipment and systems provided under this division of specifications.
- B. Manuals to also include all submittal data on all materials and equipment. Clearly indicate items provided on this project. A list giving name and address of nearest supply house carrying spare parts and name of Installation Contractor to be given to Owner.
- C. Verbally instruct Owner's representatives. Contractor to obtain letter signed by the owner's representative indicating that the in-service training has been completed.
- D. Three sets of the following data are required:
  - 1. Operating and maintenance instructions.
  - 2. Spare parts lists.
  - 3. Copies of approved submittal data.
- E. Arrange each set of data in an orderly way, and bind each set in a separate 3-ring, hard-cover binder.
- F. As soon as data accumulates, prepare one of the sets and deliver to the Owner's Representative, continuously updating this set as additional data is obtained.
- G. At completion of work, submit two complete sets of data to the Owner's Representative for distribution to the proper parties.

#### 1.5 DELIVERY AND STORAGE

- A. Insofar as possible, deliver items in manufacturers' original unopened packaging. Where this is not practical, cover items with protective materials, to keep them from being damaged. Use care in loading, transporting, unloading, and storage to keep items from being damaged.
- B. Store items in a clean dry place and protect from damage.
- C. All damaged painted surfaces of equipment to be touched up to match original paint.

## 1.6 RECORD DRAWINGS

- A. Keep a set of blueline prints at the job site exclusively for recording deviations from the drawings.
- B. Record locations and depths of buried and concealed conduits from fixed easily identifiable objects, such as building walls. Where conduits are concealed in walls, indicate distances off of building corners or other building features not likely to be disturbed by future alterations.
- C. Mark deviations in colored pencils so that work of various systems can be easily identified.
- D. When work is completed, record all deviations on clean set of record drawings.
- E. Submit three copies of completed "record drawings" to Owner's Representative for distribution.

## PART 2 PRODUCTS

## 2.1 MATERIALS AND EQUIPMENT

- A. All materials and equipment used in carrying out these specifications to be American made unless approved otherwise by the Owner and to be new and have UL listing, or listing by other recognized testing laboratory when such listings are available. Specifications and drawings indicate name, type, and catalog numbers of materials and equipment to be used as "standards" shall not be construed as limiting competition. Contractor may at his option, use materials and equipment when, in the judgment of the Designer, they are equivalent to that specified.

## PART 3 EXECUTION

## 3.1 COORDINATION

- A. Intent:
  - 1. These sections of specifications and drawings form a complete set of documents for the electrical work of this project. Neither is complete without the other. Any item mentioned in one shall be as binding as though mentioned in both.
  - 2. The intent of these specifications and drawings is to form a guide for a complete electrical installation. Where an item is reasonably necessary for a complete system but not specifically mentioned, such as pull boxes, fittings, expansion fittings, support hangers, etc.; provide same without additional cost to Owner.
  - 3. Electrical layouts indicated on drawings are diagrammatical only. Exact location of outlets to be governed by project conditions. The Designer reserves the right to make any reasonable changes (approximately 6 feet) in location of junction boxes, or equipment prior to roughing-in of such without additional cost to Owner.
- B. Insofar as it is possible to determine in advance, leave proper chases and openings. Place all outlets, anchors, sleeves, and supports prior to pouring concrete or installation of masonry work. Should contractor neglect doing this, any cutting and/or patching required to be done is at this contractor's expense.
- C. Visit site and be informed of conditions under which work must be performed. No subsequent allowance will be made because of error or failure to obtain necessary information to completely estimate and perform work involved.
- D. Designer to be mediating authority in all design related deviations and disputes arising on the project.

- E. Coordinate to assure that proper points of service transformer locations, voltage characteristics and capacity of service are in accordance with contract drawings.

### 3.2 CUTTING AND PATCHING

- A. Repair or replace routine damage caused by cutting in performance of this contract.
- B. Correct unnecessary damage caused due to installation of electrical work, brought about through carelessness or lack of coordination.
- C. Repairs to be performed with materials which match existing materials and to be installed in accordance with appropriate sections of these specifications.

### 3.3 TESTS

- A. On completion of work, installation to be entirely free from grounds, short circuits, and open circuits. Perform a thorough operational test in presence of Owner or his representative. Balance all circuits so that feeders to panels be not more than 10% out of balance between phases with all available load energized and operating. Furnish all labor, materials and instruments for above tests.
- B. Furnish Owner, as a part of closing file, a copy of such tests including identification of each circuit and readings recorded, also the main service ground test as described in Section 26 05 26 of these specifications. Test information to be furnished to Owner includes ampere readings of all panels and major circuit breakers, insulation resistance reading of motors and transformers.
- C. Prior to final observation and acceptance, test, leave in satisfactory operating condition all electrical systems and equipment including but not limited to the following:
  - 1. Fire alarm and smoke detection system.
  - 2. Lighting control system.

### 3.4 INSPECTION FEES AND PERMITS

- A. Obtain and pay for all necessary permits and inspection fees required for electrical installation.

### 3.5 IDENTIFICATION OF EQUIPMENT

- A. Properly identify all new starters, contactors, relays, safety switches and panels with permanently attached black (normal power) or red (essential systems) phenolic plates with 1/4" white engraved lettering on the face of each attached, with two sheet metal screws. Starters and relays connected by the electrical tradesman to be identified by him whether furnished by him or others.

### 3.6 TEMPORARY LIGHTS AND POWER

- A. Provide a temporary electrical lighting and power distribution system of adequate size to properly serve the following requirements, including adequate feeder sizes to prevent excessive voltage drop. Temporary work to be installed in a neat and safe manner in accordance with the National Electrical Code, Article 590, and as required by OSHA or applicable local safety codes.
- B. Provide one pigtail socket with 150 watt lamp for every 1000 square feet of floor area, evenly distributed throughout building and with minimum of one pigtail socket per room.
- C. Provide one duplex power outlet for every 1,500 square feet of floor area, evenly distributed throughout the building. Power outlets to be 20 amp, single phase located as directed by the contractor.

- D. Check with contractor prior to installation to determine if any lighting or power outlets over the maximum quantity noted above are required.
- E. Provide service and panelboards required for above lighting and power outlets.
- F. Power consumption will be paid for by the Contractor.

### 3.7 DEMOLITION

- A. Contractor shall visit the site before submitting a bid to acquaint himself with existing conditions.
- B. Where a circuit is interrupted by removal of a device or fixture from that circuit, the contractor shall install wire, conduit, etc., as required to restore service to the remaining devices and fixtures on that circuit.

### 3.8 OBSERVATIONS

- A. When field observation services are a part of the project scope, Engineer's office will provide periodic observation of the progress of work specified herein. Purpose of the observation is to ensure compliance of Contractor's work with specifications and drawings. Engineer's office will also observe tests required of Contractor as called for in other sections of specifications.
- B. Specifications and drawings represent work to be done in view of total project requirements. Final location of conduits, fixtures, panels, switchboards, etc., to eliminate possible conflict with other trades is responsibility of Contractor. Contractor to provide all supervision required for his personnel to ensure that installation is made in accordance with specifications and drawings and all safety rules and regulations are observed. In event of conflicts of work on project with other trades, Contractor to make every reasonable effort to resolve conflict through meetings and discussions with other parties involved, by preparation of drawings or other appropriate action. Only after this has been done shall the Engineer's assistance be requested.
- C. When Engineer is requested to visit project to aid in resolution of conflicts or for witnessing tests, he shall be given a minimum of 48 hours notice prior to time his presence is required at job site.

### 3.9 WARRANTY-GUARANTEE

- A. Designer reserves right to accept or reject any part of installation which does not successfully meet requirements as set out in these specifications.
- B. Contractor shall and hereby does guarantee all work installed under this division shall be free from defects in workmanship and materials for a period of one year from date of final acceptance. The above parties further agree that they will repair and replace any defective material or workmanship which becomes defective within the terms of this warranty-guarantee.

END OF SECTION 26 01 00

**SECTION 26 05 19 - CONDUCTORS - 600 VOLT AND BELOW****PART 1 GENERAL****1.1 GENERAL**

- A. Provide a complete system of conductors for lighting, power, and controls throughout building.
- B. Refer to drawings for sizes of conductors.
- C. The use of type MC cable is prohibited.

**PART 2 PRODUCTS****2.1 CONDUCTORS - POWER AND LIGHTING**

- A. Provide 98% conductivity copper conductors with 600-volt insulation.
- B. Interior conductors shall be Type THHN-2/THWN-2 insulation.
- C. 600-volt insulation for conductors installed in underground raceways shall have XLP (cross-linked polyethylene) insulation, Type XHHW-2.
- D. For feeder and branch circuit conductors No. 12 AWG and No. 10 AWG, provide solid type.
- E. For all control and motor circuits, and all conductors No. 8 AWG and larger, provide stranded type.
- F. Conductors shall be manufactured by Triangle, Phelps Dodge, Southwire, or approved substitute.
- G. Provide white or gray colored neutral conductors; provide black or color coded phase conductors.
- H. Provide No. 14 AWG stranded type THHN fixture conductors, for conductors entering fixtures and in stems of pendant fixtures.
- I. Provide type THHN stranded conductors, 90 degrees C for conductors running through continuous rows of fluorescent fixtures.

**PART 3 EXECUTION****3.1 INSTALLATION**

- A. Install pull boxes in circuits or feeders over 100' long.
- B. Make all splices or connections only at outlet, pull or junction boxes.
- C. Install instrument and data connection conductor in separate raceways from all other conductors. Separate control wiring from power wiring in separate raceways. Separation distances shall be as specified by control system manufacturer or as listed in IEEE Standard 518, whichever is greater.
- D. Bend radius on conductors shall be less than the limitations listed by the cable manufacturer.

- E. Deliver all conductors to job site new and in original wrapping, package or reel.
- F. All conductors and connections shall test free of grounds, shorts, and opens.
- G. For 20-amp, 120-volt branch circuits, provide No. 10 wire in lieu of No. 12 wire for any branch circuit in excess of 90 linear feet to prevent excessive voltage drop. Where branch circuit exceeds 175 linear feet, use No. 8 wire.
- H. Use Ideal wing nuts, Scotchlok Type Y, R, G, or B, or approved equivalent connectors for fixture connections at outlet boxes.
- I. Make feeder taps and joints with OZ type T, PT, PM or PTS, or approved equivalent clamp connectors as manufactured by Kupler, or with approved compression sleeves. Wrap connectors with No. 10 electro-seal or approved equivalent plastic filler and vinyl tape.
- J. Leave a minimum of 8" slack wire in every outlet box whether it be in use or left for future use.
- K. Match existing color code for conductors.
- L. Use factory color coded conductors where commercially available. If not, use black wire and band with color tape.

END OF SECTION 26 05 19

**SECTION 26 05 26 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS****PART 1 GENERAL****1.1 GENERAL**

- A. The entire system of raceways and equipment to be grounded in accordance with Article No. 250 of latest edition of National Electrical Code and any local regulation or governmental governing authority.

**PART 2 PRODUCTS****2.1 GROUND CLAMPS**

- A. OZ Electrical Manufacturing Company, Steel City, Appleton, or approved substitute.

- 2.2 Feeder circuits to panels, motor control centers, etc., shall have a separate green grounding conductor in conduit sized in accordance with Table 250.122 of N.E.C.

- 2.3 All branch circuits shall have a separate green grounding conductor installed in same conduit as phase and neutral conductor from panel ground bus to device. The grounding conductor shall be sized in accordance with Table 250.122 of N.E.C.

- 2.4 Flexible conduit will not be approved as achieving continuity of ground. All flexible conduit shall have a jumper wire sized to ampacity of branch breaker and shall be connected to conduit system on both ends; this applies to fixtures, motors, controls, etc.

- 2.5 All PVC conduit shall have separate ground wire installed in accordance with Table 250-94 and 250-95 of N.E.C.

**PART 3 EXECUTION****3.1 INSTALLATION**

- A. Effectively bond all grounding conductors to grounding electrodes, equipment enclosures and ground busses.
- B. Locate all grounding attachments away from areas subject to physical damage. Provide protective covering as required.
- C. Clean all non-conductive surfaces on equipment to be grounded, to assure good electrical continuity.
- D. Ground on main service shall be tested to obtain no greater than 10 ohms using test equipment similar to a "Biddle" test. Test data shall be submitted to Engineer for review and such test data shall become a part of the final brochure.

**END OF SECTION 26 05 26**

**SECTION 26 05 29 - SUPPORTING DEVICES AND HANGERS****PART 1 GENERAL****1.1 GENERAL**

- A. Provide a system of supporting devices and hangers to ensure secure support or bracing for conduit, electrical equipment, including safety switches, fixtures, outlet boxes, junction boxes, cabinets, etc.

**PART 2 PRODUCTS****2.1 ACCEPTABLE MANUFACTURERS**

- A. Provide appropriate supporting devices and hangers as manufactured by Erico Products, Inc., Steel City, Rayco, or approved substitute:
1. Vertical flange clamps (beam clamps).
  2. "Z" purlin clips.
  3. Conduit clips.
  4. Universal clamps (Beam clamps).
  5. Beam clamps (set screw type).
  6. Combination push-in conduit clips.
  7. Combination conduit hanger clamps.
  8. Flexible conduit clips.
  9. Special combination conduit clips.
  10. One hole steel straps.
  11. Minerallac conduit hangers.

**PART 3 EXECUTION****3.1 INSTALLATION**

- A. Secure conduits to within 3' of each outlet box, junction box, cabinet, fitting, etc., and at intervals not to exceed ten feet (10') for EMT and IMC conduit and in accordance with Table 344.30 (B) (2) for Rigid Steel conduit. In seismic zones, support conduits 1" and under at 6' intervals.
- B. Install clamps secured to structure for feeder and other conduits routed against the structure. Use drop rods and hangers or racks to support conduits run apart from the structure.
- C. Furnish and install suitable angle iron, channel iron or steel metal framing with accessories to support or brace electrical equipment including safety switches, fixtures, panelboards, outlet boxes, etc.
- D. Paint all supporting metal not otherwise protected, with rust inhibiting primer and then with a finish coat if appropriate to match the surrounding metal surfaces. (Prepainted or galvanized support material is not required to be painted or repainted.)
- E. Support all lighting fixtures including lay-in troffers from the structure as detailed on the drawings to comply with seismic requirements for the specific area.

- F. Use of chains, perforated iron, bailing wire, or tie wire for supporting conduit runs will not be permitted.

END OF SECTION 26 05 29

**SECTION 26 05 34 - RACEWAYS AND CONDUIT SYSTEMS****PART 1 GENERAL****1.1 GENERAL**

- A. Provide a complete conduit system with associated couplings, connectors, and fittings.
- B. Conduits shall be mechanically and electrically continuous from outlet to outlet and from outlets to cabinets, pull or junction boxes.

**1.2 SUBMITTALS**

- A. Submittal for products furnished under this section is not required.

**PART 2 PRODUCTS****2.1 ACCEPTABLE MANUFACTURERS**

- A. IMC, RGS and EMT conduit shall be hot-dip galvanized, or electrogalvanized steel by Triangle, Raco, Allied, or approved substitute. Catalog numbers used below are those of Raco and shall be considered as standards.
- B. Erickson couplings, Raco 1502-1516 for IMC and RGS, shall be used where neither length of conduit can be rotated.
- C. IMC/RGS conduit connectors from 3/4" to 4" trade sizes shall use compression type, Raco 1802-1816.
- D. EMT conduit connectors from 3/4" to 4" trade sizes shall use compression type, Raco 2902-2946.
- E. Grounding bushings shall be Raco 1212-1296.
- F. Insulated bushings shall be Raco 1402-1416.
- G. Weatherproof hub shall be Raco 1702-1716, complete with sealing "O" ring or sealing locknuts.

**2.2 ELECTRICAL METALLIC TUBING (EMT)**

- A. Use Electric Metallic Tubing (EMT) for:
  - 1. Branch circuits installed overhead, both exposed and concealed, installed more than 6 feet above finished floor.
  - 2. Branch circuits originating from isolated panels (O.R., Cystoscopy, or Delivery).

**2.3 INTERMEDIATE METAL CONDUIT (IMC)**

- A. Use Intermediate Metal Conduit (IMC) for:
  - 1. Panelboard feeders.
  - 2. Branch circuits installed in hazardous areas.
  - 3. Branch circuits and feeders installed in concrete slabs at ground floor.
  - 4. Branch circuits installed exposed below 6 feet above finished floor.
  - 5. Branch circuits installed in wet locations.

6. Pendant drops.

## 2.4 RIGID GALVANIZED STEEL (RGS)

- A. Conduit Use:
  1. Interior and exterior exposed primary service conduit.
  2. Interior and exterior exposed secondary service conduit.
  3. Exterior exposed branch circuits.

## 2.5 FLEXIBLE METAL CONDUIT

- A. Provide a flexible metal conduit system for the termination points at equipment that may possibly vibrate such as motors, welders, etc. The length shall not exceed 6 feet.
- B. Conduit shall be electrically continuous from outlet or conduit end to the utilization equipment.
- C. The total length of flexible conduit in any circuit shall not exceed 6 feet.
- D. Where exposed to continuous or intermittent moisture, conduit shall be liquid tight flexible type, U.L. Type EF.
- E. The use of type MC cable is prohibited.

## PART 3 EXECUTION

### 3.1 INSTALLATION

- A. Minimum size of conduits shall be 3/4 inch.
- B. Conduit joints shall be cut square, threaded, reamed smooth, and drawn up tight so conduit ends will butt in couplings, connectors, and fittings.
- C. Make bends or offsets with standard ells or field bends with an approved bender.
- D. Run conduits concealed in floor slabs, below slabs, or in walls in direct line with long sweep bends or offsets. Run exposed conduits and conduits run above lay-in ceilings parallel to and at right angles to building lines. Group multiple conduit runs in banks.
- E. Secure conduits to all boxes and cabinets with two locknuts and bushings so system will be electrically continuous from service to all outlets.
- F. Cap ends of conduits to prevent entrance of water and other foreign material during construction.
- G. Complete conduit systems before pulling conductors.
- H. Provide cable supports in conduits rising vertically in accordance with the National Electrical Code, Article 300-19.
- I. Provide nylon pull cord in all empty conduits. Steel wire not acceptable as pull wire.
- J. Conduits which pass through floor slabs (except ground floor) shall be sealed with concrete grout. Seal around conduits or other wiring materials passing through partitions, which extend to the underside of the

slab above, and those passing through smoke partitions and fire-rated walls. Refer to appropriate details on architectural and mechanical drawings.

- K. Conduits which enter crawl space, tunnels, and basements from outside the building shall be grouted-in to prevent entry of gases, vapors, insects, or rodents to these spaces from street mains.
- L. Where IMC or RGS conduit is installed in a cabinet, junction box, pull box, or auxiliary gutter, conductors shall be protected by an insulated bushing. Locknuts shall be installed on conduit outside and inside enclosure.
- M. In areas where enclosed and gasketed fixtures and weatherproof devices are specified, where rigid conduit enters a sheet metal enclosure, junction box and outlet box, and not terminated in a threaded hub, a steel, or malleable iron nylon insulated hub, complete with recessed sealing "O" ring or sealing locknut shall be used.
- N. Where conduits running overhead pass through building expansion joints they shall be connected by flexible metal conduit of same size with sufficient slack to allow conduits on either side of expansion joint to move a minimum of 3 inches in any direction. Provide supports as required on each side of expansion joint, all in accordance with seismic requirements of specific area.
- O. Conduits for feeders and branch circuits shall be terminated directly into panelboard enclosure without the use of pull boxes, junction boxes, wireways, or auxiliary gutters, unless the panelboard enclosure does not provide sufficient surface area for all conduits. Where such cases exist, the contractor shall notify the Designer. In no case will splices in such boxes, wireways, etc., be permitted.
- P. Failure to route conduit through building without interfering with other equipment and construction shall not constitute a reason for an extra charge. Equipment, conduit, and fixtures shall fit into available spaces in building and shall not be introduced into building at such times and manner as to cause damage to structure. Equipment requiring servicing shall be readily accessible.
- Q. All conduit to be spot painted within 6 inches of termination and every 10 feet using the following color code:
  - 1. Yellow: Life Safety Branch
  - 2. Red: Fire Alarm System
- R. No conduit shall be installed in elevated slabs.

### 3.2 EMT

- A. Do not use electric metallic tubing in cinder concrete or cinder fill where subject to permanent moisture unless protected on all sides by a layer of noncinder concrete at least 2 inches thick or unless the EMT is at least 18 inches under the fill. Use of set-screw fitting is not acceptable in concrete or in fill under slab.

### 3.3 FLEXIBLE METAL CONDUIT

- A. Flexible metal conduits shall be 3/4 inch minimum size.
- B. Where fittings for liquidtight flexible conduit are brought into an enclosure with a knock-out, a gasket assembly, consisting of one piece "O" ring, with Buna-N sealing material, Raco Series 3500, shall be installed on outside of box. Fittings shall be made of either steel or malleable iron only, and shall have insulated throats or insulated bushings.
- C. In dry locations, where final connections to motors and other equipment may be made with flexible metal conduit, fittings shall be of steel or malleable iron only with insulated throats or insulated bushings, and shall be of wedge and screw type having an angular wedge fitting between convolutions of conduit.

- D. An additional copper ground wire shall be installed inside of flexible conduit and bonded at each end to assure continuity of ground to lighting fixtures, controls, and other utilization equipment.
- E. All recessed lighting fixtures shall be connected with flexible metallic conduit from outlet box to fixture. Rigid conduit connections to lighting fixtures are not acceptable.
- F. Install liquidtight flexible conduit in such a manner as to prevent liquids from running on the surface toward fittings.
- G. Allow sufficient slack conduit to reduce the effect of vibration.

END OF SECTION 26 05 34

**SECTION 26 51 00 - INTERIOR LIGHTING AND LAMPS****PART 1 GENERAL****1.1 GENERAL**

- A. Provide labor, material, equipment and services necessary to provide all interior lighting fixtures, necessary hangers and lamps.

**1.2 SUBMITTALS**

- A. Submit for approval prior to purchasing fixtures complete fixture lists of fixtures proposed to be used. Include cuts of both specified fixture and proposed equivalent fixtures if fixtures other than those specified are submitted.

**PART 2 PRODUCTS****2.1 ACCEPTABLE MANUFACTURERS**

- A. Provide lighting fixtures indicated by type on lighting fixture schedule on drawings.

**2.2 EQUIPMENT REQUIREMENTS**

- A. Fixtures shall be designed in such a manner that all serviceable electrical components may be replaced without disturbing fixture in or on ceiling.
- B. Recessed fixtures that are to be installed in a concrete slab shall be specifically designed for concrete installation.
- C. Recessed fluorescent fixtures shown with acrylic lenses to be furnished with 0.125 minimum thickness acrylic lens.
- D. Provide UL labeled electronic ballasts with less than 10 percent THD for fluorescent fixtures.

**PART 3 EXECUTION****3.1 INSTALLATION REQUIREMENTS**

- A. Fixtures shall be securely mounted as required by Section 410, NEC and as specified herein.
- B. Fixtures mounted in a suspended ceiling shall be secured to the grid with approved clips as required by the NEC.
- C. Fixtures shall be mounted in locations as shown on architectural reflected ceiling drawings.
- D. Mount fixtures as called for in schedule on electrical drawings. Determine type of ceiling to be installed in each space from architectural drawings and schedules and furnish fixtures suitable for the exact type.
- E. Receive, store, uncrate, and install lighting fixtures shown in schedule on drawings to be furnished by others.

- F. Recessed fixtures in dropped ceiling areas shall be connected using Greenfield and No. 14 THHN wire. Greenfield shall be connected to fixture and outlet box. Each piece of Greenfield shall include in it a separate insulated green grounding conductor not smaller than No. 14 AWG for grounding continuity between fixture and conduit system. Grounding conductor shall be mechanically connected in a permanent and effective manner to fixture and conduit system and shall be electrical continuous. No conduit shall enter a recessed fixture directly as this would prevent removal of fixture without disturbing balance of circuit.
- G. Joints in fixture wiring shall be made using wire nuts, preinsulated Scotch locks, Ideal No. 30-410 crimps and No. 30-415 wrap caps, or other approved mechanical means of connection.
- H. Adjustable type fixtures shall be adjusted by the Contractor to illuminate intended area to satisfaction of Owner.
- I. Recessed fixtures installed in exposed or concealed tee bar ceilings may use ceiling grid to support fixtures. Fixtures shall be securely fastened to ceiling framework per NEC Article 410.
- J. Recessed fixtures installed in exposed or concealed tee bar ceilings may not use ceiling grid to support fixtures. Fixtures shall be securely fastened to ceiling framework per NEC Article 410-16, and shall be supported as described in seismic detail on drawings.
- K. Surface mounted fixtures on exposed tee bar ceilings shall use patented grip clamps on tee bars to secure fixtures and shall be supported by structure.
- L. Surface or recessed fixtures in or on plastered or drywall ceilings shall be supported in accordance with seismic fixture mounting details or mechanical drawings and shall not depend on ceilings for support.
- M. Support fixtures in seismic zones as required by local governing authority.

END OF SECTION 26 51 00